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Caladenia deformis,
North East Victoria,
Louise Saunders 26/9/91

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TALKING POINT

Our Second Australasian Native Orchid Society Conference and Show is, at last, about to come to fruition.

With it comes all the excitement of meeting friends we have not seen for a while, the prospect of lengthy discussions on our beloved native orchids and the knowledge that anyone, who is anyone, in this field will be there.

The adrenalin has already started to soar in many of us and will continue until we are on the threshold of our Conference and Show.

Is this feeling unique because our native orchids are unique, or is it the fellowship and the advancement of knowledge that motivates us? Perhaps it is because we are now 30 years of age, our inaugural meeting was on the 6th July, 1963 and *The Orchadian* was first published in August, 1963.

The first Conference and Show at Wollongong three years ago was a great success and is still in our minds. It was only the beginning of another phase in the growing up of our Society. What will the second one do for us and our precious gems? Only time will tell. To be there, to take part, is important, helping us all go forward to a bright and expansive future, not only here in Australia but throughout the world. Let us all make this the beginning of a new era for The Australasian Native Orchid Society, for conservation, for goodwill and for the survival of our Australasian native orchids.

THE SECOND AUSTRALASIAN
NATIVE ORCHID SOCIETY

CONFERENCE AND SHOW

Hosted by The Native Orchid Society of Toowoomba Inc.

to be held at

The University of Southern Queensland,
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SEE YOU THERE!

Walter T. Upton ❀

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NATIVE ORCHIDS ON THE MAIN RANGE, TOOWOOMBA, QUEENSLAND

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Abstract: Australian native orchids abound on the Main Range, Toowoomba, Queensland. Local naturalists explored the area in the late 19th century and early 20th century, discovering three orchid species new to science, *Dendrobium* X *delicatum, Sarcochilus hartmannii* and *S. weinthalii,* and numerous orchids new to this area. Such enthusiasm for the local native orchid flora lead to the establishment of local orchid societies dedicated to the study, conservation and enjoyment of Australasian native orchids. This year, the Native Orchid Society of Toowoomba Inc. (N.O.S.T.Inc.) will host the Second Australasian Native Orchid Conference and Show. Hence, it is appropriate to reflect on the history of N.O.S.T.Inc., to consider the topographic and climatic characteristics and native vegetation of the Main Range, Toowoomba and to discuss the contribution made to hybridisation and native orchid folklore of the three species whose type location is the Main Range, Toowoomba, Queensland.

Introduction

The Main Range, Queensland, is the type location of *Dendrobium* X *delicatum* (Bailey) Bailey, *Sarcochilus hartmannii* F. Muell., and *S. weinthalii* Bailey. Of these orchids, *Dendrobium* X *delicatum* has been involved along with *D.* X *kestevenii* in native orchid folklore. All three orchids have contributed significantly to the development of hybrids within their respective genus.

Local naturalists have long enjoyed the study of the native flora and were to the forefront in the formation of societies dedicated to the study, conservation and enjoyment of Australian native orchids.

This article gives a brief description of the location, topography, climate and vegetation of the Main Range, Queensland, a short history of the Native Orchid Society of Toowoomba Inc. and a synopsis of the culture of the three native orchids whose type location is the Main Range, Queensland and the contribution these orchids have made to modern-day hybrids.

The Main Range, Queensland

The Main Range, Queensland, refers to that portion of the Great Dividing Range which has a general north-south axis and is located directly west of Brisbane in southern Queensland.

To the north of the Main Range, the Great Dividing Range turns north-west and runs into the Bunya Mountains where Mt Kiangarow (1,135m) is located. To the south, the Great Dividing Range continues into the peaks around Cunningham's Gap, Mt Castle (914m), Mt Cordeaux (1,128m) and Spicers Peak (1,219m) and further south to the area referred to as the Granite Belt, around Stanthorpe in southern Queensland, before continueing into New South Wales.

At Toowoomba, the Main Range has an altitude of about 600m, but to the north and south of Toowoomba, the altitude increases to a general height of about 800m, with isolated peaks to about 1,100m. It has a general north-south axis with steep slopes and some cliff escarpments, on the eastern aspect and a gentle slope away to the west.

Rainfall is highest along the range, decreasing slightly to the east, but declining rapidly to the west. Toowoomba, astride the top of the range, has a rainfall of about 1,000mm per year, but Dalby, about 80 km west, has a rainfall of about 670mm per year.

Prevailing winds are mostly moist easterlies in summer and cool, dry westerlies in winter. Air temperatures range from minimums of 0–3°C in July, to maximums of 28–32°C in January.

The original vegetation along the range was a wet sclerophyll forest with pockets of temperate rainforest. To the east, as the fertility of the soil declines, the wet sclerophyll forest gave way to a dry sclerophyll forest and finally an open forest and grassland dominated by *Eucalyptus* species. To the west are the treeless grasslands on the black soil plains of the Darling Downs.

The Main Range and its surrounding escarpments and adjoining ranges have one of the largest and most varied orchid flora in Australia, being at the crossover between the northern habitats preferred by the epiphytic orchid flora and the southern habitats preferred by the terrestrial orchid flora. Epiphytic and lithophytic species of *Bulbophyllum, Cymbidium, Dendrobium, Liparis, Oberonia, Plectorrhiza, Rhinerrhiza* and *Sarcochilus* abound in the forests of the Main Range and eastern escarpments. In the more open forests of the eastern and western slopes of the Main Range and south in the Granite Belt, terrestrial species of *Caladenia, Caleana, Calochilus, Chiloglottis, Corybas, Diurus, Glossodia, Microtis, Prasophyllum, Pterostylis, Thelymitra* and *Pseudovanilla* (syn. *Galeola*) can be found.

Native Orchid Societies in Toowoomba

A.N.O.S. Darling Downs Group

With such a wide variety of orchids available in the forests within easy travel of Toowoomba, it was natural that local people became interested in the native orchids of their area. Interest in orchid growing as a hobby was fuelled by the easier availability of exotic orchid species and hybrids during the 1940's and 1950's. Whilst the first orchid society to be formed in Toowoomba, the Toowoomba Orchid Society Inc., focused more on exotic orchids than native orchids, there was a strong interest amongst the early members in native species and hybrids. Hence, it was not surprising that these individuals sought to form an orchid society dedicated to the study, culture and conservation of Australian native orchids.

In May, 1969, Mr W. H. (Bill) Murdoch answered a call for assistance from Mrs Hilda Poxon to attend a public meeting she had called to start a native orchid society in Toowoomba. Bill Murdoch had filled this role many times in establishing Australasian Native Orchid Societies dedicated to the study, conservation and enjoyment of native orchids and his efforts have been recorded by Grundon (1988, 1989, 1991) and Kerr (1991). The native orchid growers in Toowoomba are justifiably proud of the connection their club has with this great Australian. They expressed their appreciation by creating Bill Murdoch their first Life Member in 1971.

They are also proud of the efforts of Hilda Poxon, known affectionately amonst the members of that era as “HP”, in establishing the A.N.O.S. Darling Downs Group. This organisation came into being on 3rd July, 1969, when 30 people decided on the name of the branch and elected Mr Ray Hill as the first President. Hilda Poxon was honoured by being created the second Life Member of the A.N.O.S. Darling Downs Group in July, 1977 and now lives in retirement at a nursing home in Toowoomba.

She will be forever remembered amongst native orchid growers by the orchid named in her honour, *Dendrobium* Hilda Poxon (*D. speciosum* x *D. tetragonum*). This cross was created first by Ira Butler (Rudkin, 1990) and was made available through the Wayside Nursery of Bill and Jean Cannons as the cross WSB–202. It proved an immediate success and one of the original seedlings went on to win national awards as *D.* Hilda Poxon ‘Winifred Mary’ HCC/AOC–QOS and tied for the Ira Butler Trophy in 1988 (Rudkin, 1988). The cross has been repeated many times over by more recent hybridists, using different clones of *D. tetragonum* and *D. speciosum,* with some outstanding successes. There is little doubt that more national awards will be accumulated by *D.* Hilda Poxon during the 1990's as the better clones of these more recently created plants reach maturity.

N.O.S.T.Inc.

In 1988, it became necessary to change the name of the A.N.O.S. Darling Downs Group to the Native Orchid Society of Toowoomba Inc. This move was forced upon the members as a result of incorporation. When the club made application to incorporate under the name A.N.O.S. Darling Downs Group, the Queensland Justice Department ruled that the group could not be considered as being the parent body for either an Australasian-wide membership or for Darling Downs-wide membership. Therefore, neither A.N.O.S. nor Darling Downs could be included in the incorporated name for the club. Hence, the name, Native Orchid Society of Toowoomba Inc., was adopted with some reluctance and dismay by the membership. However, the aims and objectives of the club remained the same and members consider themselves to be full members of the A.N.O.S. fraternity.

It was gratifying that A.N.O.S. Council also considered us full members of the A.N.O.S. fraternity when they received our application to host the Second Australasian Native Orchid Conference and Show. Club members are extremely proud to be granted the honour of hosting this event, especially so since the club has never been one of the larger members of the A.N.O.S. group.

Thirty people are reported to have attended the first meeting of the club on 3rd July, 1969. Over the years, ordinary membership has built up to about 80 members. Attendance at meetings has averaged about 25 people over the club's 24-year existence, but fell to single figures at one stage during the early 1980's. However, membership numbers and interest in attending meetings have revived during the 1990's, due to the untiring efforts of many of the club's past and present office-bearers.

Today there is keen interest in Australasian native orchids in Toowoomba and the activities of N.O.S.T.Inc. are strongly supported. This has welded a hardworking, co-operative spirit amongst the membership that has made it possible to organise and co-ordinate the many activities needed for a major nationwide orchid conference and show.

***Dendrobium* X *delicatum* (Bailey) Bailey**

(Plate 3)

History

The type specimen of *D.* X *delicatum* was collected by Benjamin Crow and C. H. Hartmann from the Main Range, Queensland (Clements, 1989). However, other authors claim it was collected by Benjamin Crow alone (Gordon, 1965; Blombery, 1965). Apart from Clements (1989) who gives the Main Range as the type location, most other authors state that it was collected from Spring Bluff, a basaltic cliff on the Main Range, some 5km north of Toowoomba (Gordon, 1965; Blombery, 1965; Gregory, 1978a).

It was described in 1884 by F. M. Bailey, at that time the Government Botanist for Queensland, under the name *D. speciosum* Smith var. *delicatum* Bailey. In 1902, Bailey recognised that this taxon represented a naturally occurring hybrid between *D. speciosum* and *D. kingianum,* both of which were (and still are) abundant within the area of the Main Range and elevated the plant to specific rank as *D.* X *delicatum* (Bailey) Bailey).

Many people claim to have obtained pieces from the type specimen. However, it is doubtful if these are from the original type specimen, as explained in a letter from Alec Blombery (8 Terry Road, Eastwood, N.S.W.) that was printed in the April, 1972, issude of *Native Orchid News* (Newsletter of A.N.O.S. Darling Downs Group):–

> "It is doubtful as to whether the piece of *D.* X *delicatum* is from the original plant specimen collected and named by Bailey, but could no doubt be from a piece of the plant collected by the late Fred Weinthal, who collected a piece of the plant from Spring Bluff shortly after it was named. On his death, Fred Weinthal's daughter passed the plant on to me and it is at present growing in a basket two feet in diameter. Over the years it has produced hundreds of aerials which I have passed around. I understand several different clumps of the orchid were collected from Spring Bluff and there are various stories of the plant's being part of the original one collected. I think the main point is that the species is attractive in all the different forms I have seen and it is very easily grown."

Description

D. X *delicatum* is a lithophyte, although Ted Gregory states he collected one clone growing epiphytically in the head of a Rosewood tree (Gregory, 1978a). A complete description of *D.* X *delicatum* is given by Dockrill (1969) and only a brief description is provided here.

It forms dense clumps of pseudobulbs that range from 10cm to 40cm high. The pseudobulbs are broadest at the base and taper evenly to a broad tip. Two to six, leathery leaves are borne at the tip of the pseudobulb. Three to five racemes are carried at the tips of the pseudobulbs. The racemes are 12–35cm long and carry from 5–25 flowers. The flowers are 15–25mm in diameter and are white to deep pink in colour, with many having buff, bicolour, or splash-petal effects. The flowering time is from August to October.

The Controversy over *D.* X *delicatum* (Bailey) Bailey and *D.* X *kestevenii* Rupp

There has been considerable discussion over the relationship between *D.* X *delicatum* and *D.* X *kestevenii*. Upton (1965) states that the type specimen of *D.* X *kestevenii* was collected by a Mr Slater on Alum Mountain, Bulahdelah and was given to Dr H. L. Kesteven after whom the Rev. H. M. R. Rupp named the plant in 1931. Gordon (1965) has provided an excellent summary of the similarities and differences between these plants and readers who wish to explore this subject further are referred to Gordon's article.

Although Bailey's description was published first and his name therefore had precedence, Rupp and his supporters put up a stout defence for *D.* X *kestevenii* being a different species from that of *D.* X *delicatum*. Their defence was based on the great difference in size between Bailey's plant (*D.* X *delicatum*) and Rupp's plant (*D.* X *kestevenii*) and that, in the 1930's, no plants similar to either had been found between Spring Bluff and Alum Mountain, a distance of about 450km. An excellent, detailed, historical account of the correspondence and thoughts of Rupp, Weinthal and others concerning the description and naming of *D.* X *kestevenii* has been provided by Blombery (1965).

However, since the 1930's, numerous collections and sightings have been made of plants which range in size between Bailey's larger *D.* X *delicatum* and Rupp's smaller *D.* X *kestevenii.* Furthermore, these plants have been collected from an area about 600km long, from the Blackall Range in the north (a spur of the Main Range, about 200km north of Toowoomba) to the Hunter River in the south (about 50km south of Alum Mountain) (Dockrill, 1969; Gregory, 1978a).

In recent years, most taxonomists and native orchid enthusiasts have agreed that *D.* X *delicatum* and *D.* X *kestevenii* are naturally occurring hybrids between different clones of two extremely variable species, *D. kingianum* and *D. speciosum* and that *D.* X *kestevenii* was a synonym of *D.* X *delicatum*.

More recently, however, Clements (1989) has resurrected *D.* X *kestevenii* as a valid species representing a naturally occurring hybrid population between *D. kingianum* and *D. speciosum* (syn. *D. speciosum* var. *speciosum*), while *D.* X *delicatum* represents a naturally occurring hybrid population between *D. kingianum* and *D. tarberi* (syn. *D. speciosum* var. *hillii*). Clements also suggests that the shorter, more highly coloured variety described by Rupp as *D.* X *kestevenii* var. *coloratum*, may have originated from a backcross of *D.* X *kestevenii* to *D. kingianum*.

Culture

D. X *delicatum* is a forgiving and easy plant to cultivate. Although it grows naturally as a lithophyte, it can be grown easily under bushhouse conditions as a pot subject. It prefers high light and good air movement. While it will tolerate full sun, *D.* X *delicatum* will grow and flower well when provided with 50–70% shade. Gregory (1978a) advises using shallow terracotta pots that are slightly on the large size for the base of the plant. However, if deep pots are to be used, they should be filled with crocks or lumps of sandstone to at least one third their depth. A coarse, well drained compost of bark and charcoal is preferred by most successful growers of *D.* X *delicatum*.

Regular watering during the summer growing season with light fertilising is advisable. The major pest to watch for is the Dendrobium beetle which can devastate the flowers and new shoots during spring and summer. While any contact-type insectitice will control this pest, regular inspections and hand killing the adult beetles and the larvae is also advisable. Aphids can be a major concern during the flowering season and can be controlled by regular spraying with contact-type insecticides.

Provided the potting mix is well drained and plenty of air movement is provided, most *D.* X *delicatum* plants have few disease problems. However, regular drenching of the roots and compost with fungicides that control *Phytophthora* and *Pythium* fungi is advisable during persistent wet weather.

Use in hybridisation

Probably the first use of *Dendrobium* X *delicatum* in breeding was with clones collected from naturally occurring populations. However, there is no doubt that the superior clones in use today have been recreated by man using selected clones of *D. speciosum* and *D. kingianum*. The similarity of many of the man-made seedlings to those found in the naturally occurring populations has confirmed the assumed parentage of *D.* X *delicatum*.

In 1892, Lawrence registered *D.* Specio-kingianum as the name for the horticultural hybrid between *D. speciosum* and *D. kingianum*. While this has caused some confusion amongst native orchid growers, it should be noted that the International Authority for Registration of Orchid Hybrids (I.A.R.O.H.) registers horticultural names and has accepted *D.* Specio-kingianum as the horticultural name for this hybrid. *D.* X *delicatum* remains the taxonomic name accepted in scientific literature. For some years, the I.A.R.O.H. accepted both *D.* X *delicatum* and *D.* Specio-kingianum as valid parental names on the assumption that when *D.* Specio-kingianum was given, the parent was a man-made hybrid and when *D.* X *delicatum* was given, the parent was from a naturally occurring population. However, it should be noted that checklists of Australian native orchid hybrids published by A.N.O.S. (1988), Kavulak (1988) and Lynch (1991) list all hybrids registered with the I.A.R.O.H. with either *D.* Specio-kingianum or *D.* X *delicatum* as a parent, under the name *D.* X *delicatum* as the registered parent.

To date (I.A.R.O.H. lists, February, 1993), 21 hybrids have been registered with *D.* X *delicatum* or *D.* Specio-kingianum as a direct parent:–

x *adae* = Kevin Banks
x Andrew Persson = Tom Jupp
x Ausie Mist = Aussie Sandy
x Aussie Starlight = Aussie Reward
x Ellen = Delicate Ellen
x Emma = Delemma
x Eureka = Aussie Love
x *falcorostrum* = Delicate Falcon
x Gillian Leaney = Castle
x *gracilicaule* = Delicate Gold
x X *gracillimum* = Sun Sprite
x Kim = Brinawa Jewel
x King Falcon = Delicate King
x *kingianum* = Gillian Leaney
x Kingrose = Debra Wray
x Lynette Banks = Ken Roberts
x Peter = Memoria Eric Gordon
x *speciosum* = Jane Leaney
x Star of Gold = Star One
x X *superbiens* = Elsie Cox
x *tetragonum* = Ku-Ring-Gai

Two of these hybrids, Gillian Leaney (X *delicatum* x *kingianum*) and Jane Leaney (X *delicatum* x *speciosum*), represent backcrosses to the parents of *D.* X *delicatum*, while *D.* Gillian Leaney has itself been crossed back to its parent, *D.* X *delicatum*, to produce *D.* Castle, to date the only hybrid with *D.* X *delicatum* on both sides of the parentage.

It is difficult to see where some of the above lines of breeding are leading. For example: *D.* Aussie Love, *D.* Delicate Falcon, *D.* Delicate Gold, *D.* Sun Sprite, *D.* Brinawa Jewel, *D.* King Falcon, *D.* Delicate King, *D.* Gillian Leaney, *D.* Debra Wray, *D.* Ken Roberts and *D.* Memoria Eric Gordon represent new mixes of well used species of the Section

Plate 1: *Sarcochilus* Susan 'Lavender Doll' AD/AOC Photo: J. Woolf

Plate 2: *Dendrobium* Ku-Ring-Gai 'Ann Brown' HCC/QOS Photo: J. Woolf

Plate 3: *Dendrobium* X *delicatum* 'Marylyn Joy' Photo: J. Woolf

Plate 4: *Chiloglottis sylvestris* Photo: S. Crane

Plate 5: *Sarcochilus weinthalii* Photo: J. Woolf

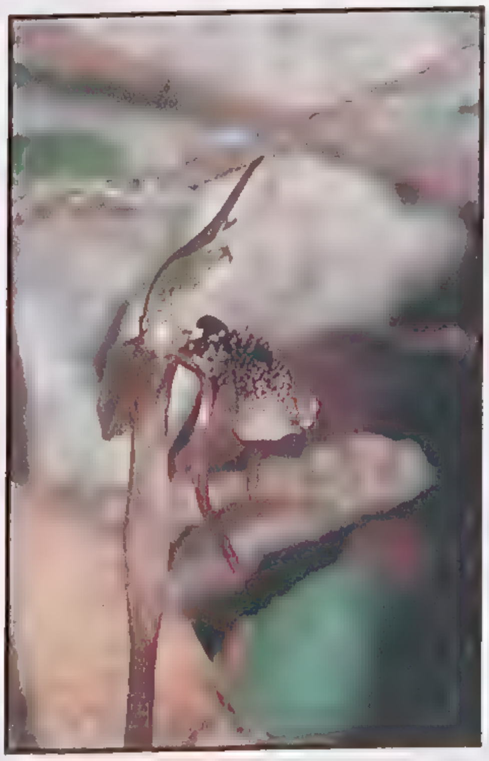

Plate 6: *Chiloglottis sylvestris* Photo: S. Crane

Plate 7: *Chiloglottis sylvestris* Photo: S. Crane

Dendrocoryne (i.e. *kingianum, jonesii, speciosum, gracilicaule, falcorostrum* and *adae*). While easier to cultivate plants with superior flower form are appearing, they look very similar to many of the other hybrids where only these species have been used as parents. Perhaps the more spectacular of the offspring from *Dendrobium* X *delicatum* are the grex where *D. tetragonum* has been used in the breeding, such as *D.* Ku-Ring-Gai (Plate 2), *D.* Star One, *D.* Aussie Reward and *D.* Delicate Ellen.

In breeding onwards from these grex, it is worth noting that *D.* Ku-Ring-Gai has produced some highly desirable and colourful offspring, such as *D.* Gold Vista (x *falcorostrum*), *D.* Warrior (x *D.* Hilda Poxon), *D.* Ring of Fire (x *D.* John Upton), *D.* Zip (x *kingianum*), and *D.* Star Child (x *D.* Star of Gold). Perhaps a line of breeding from *D.* X *delicatum* that might be worth following would be to combine the better clones from the grex *D.* Ku-Ring-Gai, *D.* Star One, *D.* Aussie Reward, *D.* Delicate Ellen and their offspring with *D. bigibbum* and its offspring. In this respect, *D.* Elsie Cox (X *delicatum* x X *superbiens*) is leading the way by combining the cool growing species *D. kingianum* and *D. speciosum* with the warm growing species *D. discolor* and *D. bigibbum*. Similar combinations have provided exciting new hybrids such as *D.* Elegant Heart (*D.* Peewee x *D. speciosum*), *D.* Aussie Angel (*D.* Aussie Ira x *D. bigibbum*), *D.* Brinawa (*D. bigibbum* x *D.* Hilda Poxon), *D.* Molly Dunne (*D.* Ellen x *D.* Brinawa), *D.* Brolga (*D.* Hilda Poxon x *D.* Peewee), *D.* Superb-King (Plate 25) (*D. speciosum* x X *superbiens), D.* Anne's Rainbow (Plates 19–22) (*D.* Aussie Angel x *D. speciosum*) and *D.* Colonial Campio (Plate 23) (*D.* Aussie Angel x *D.* Hilda Poxon).

Sarcochilus hartmannii **F. Muell.**

History

Toowoomba naturalist, C. H. Hartmann, collected the type specimens of *S. hartmannii* from Toowoomba (Clements, 1989) and sent plants to Baron Ferdinand von Mueller who described the species in 1874, naming it after the collector.

Description

Dockrill (1969) states that *S. hartmannii* is an extremely variable species in both plant and flower form and that it is closely allied to and often mistaken for *S. fitzgeraldii*. It grows as a lithophyte, often cohabiting the same sheltered cliff faces with *D.* X *delicatum* and *D. kingianum*. However, Gregory (1978b) states having seen small, single-stemmed plants growing epiphytically on Sandpaper Figs and Red Mountain Oaks on Blue Knob.

S. hartmannii forms clumps or large dense masses of erect to pendulous stems usually 10–40cm long. Up to 10 fleshy leaves, 5–20cm long are carried on each stem. Thick fleshy roots arise from the axils of the lowest leaves, while inflorescences arise from the leaf axils of leaves mid-way along the stem. Each stem will carry 4–8 inflorescences that are about 6–20cm long and densely packed with 5–30 flowers. The flowers open widely, are 1–4cm wide and are crystalline white in colour, usually with a few to many deep maroon to red or reddish brown spots near the base of the sepals and petals. the flowering season is August to November.

The limits of the distribution of *S. hartmannii* are somewhat uncertain. Dockrill (1969), Gregory (1978b) and Roberts (1992) state that the most probable distribution is from a southern limit of the Hastings-Manning River systems in north-eastern New South Wales to a northern limit somewhere in south-eastern Queensland, probably the Blackall Ranges. Reported sightings of this species on the Atherton Tablelands and the Paluma Range of north Queensland could not be confirmed by Dockrill (1969).

Plants with a more slender habit, longer thinner leaves, smaller, yellow coloured flowers with brownish spots are found toward the southern limits of this species. Jones and Clements (1993) has recently described this form as a new species using the name *S. aequalis* D. Jones *et* M. Clements (Jones and Clements, 1993).

A number of superior forms of *S. hartmannii* have been identified. Gregory

(1978b), Banks (1980) and Roberts (1992) identify forms from Mt Lindsay, Blue Knob and the Numinbah Valley as being superior in flower form to those that occur throughout the remainder of its range.

Culture

S. hartmannii is a lithophyte which grows well as a basket or pot subject. A compost that drains very freely must be used. The more successful growers use mixtures of bark, charcoal and stone and shallow pots, often terracotta saucers, are advisable (Gregory, 1978b; Banks, 1980). Drainage needs to be as perfect as possible and good air movement is essential. Gregory (1978b) states that the best results can often be obtained by hanging the plants 1–2m above the ground. *S. hartmannii* prefers broken shade, not full sun and will do better under 70–80% shadecloth in a bushhouse setting (Banks, 1980).

Frequent watering, especially in spring and summer, is advisable, although Gregory (1978b) suggests keeping the plants on the drier side during winter. Weak, but frequent applications of a well balanced, complete fertiliser are adequte to provide the nutritional needs of this species (Gregory, 1978; Banks, 1980).

S. hartmannii is very susceptible to bacterial rots and root diseases caused by the fungi *Phytophthora* and *Pythium*. Often the cause of both these problems is a compost that drains poorly and lack of air movement to dry the foliage and crowns of the plants. Gregory (1978b) suggests that good air movement is the most important factor in maintaining fungus-free growth. However, regular drenching of the roots and compost with fungicides that control *Phytophthora* and *Pythium* fungi are advisable during persistent wet weather.

Use in Hybridisation

Ira Butler is considered the doyen of hybridists within the Australian *Sarcanthinae* and has been responsible for popularising this line of breeding (Rudkin, 1990). He used *S. hartmannii* widely in his early work and this trend has continued amongst the hybridists today. Up to February, 1993, 25 hybrids within the genus *Sarcochilus* have been registered with *S. hartmannii* as a direct parent. In addition, this species has been used as a direct parent in four intergeneric hybrids with species or hybrids from the *Rhinerrhiza, Plectorrhiza* and *Phalaenopsis* genera:–

Sarcochilus:

x *australis* = Southern Cross
x Aussie Dawn = First Light
x Canary = Gwen
x *ceciliae* = Lois
x *dilatatus* = Aussie Dawn
x Elizabeth = Sandon Rose
x *falcatus* = Melba
x *fitzgeraldii* = Fitzhart
x Fitzhart = Heidi
x *hillii* = Minuet
x *hirticalcar* = *Parachilus* Riverdene
x Lois = Pinkhart
x Mavis = Pinky
x Melba = George Colthup
x *moorei* = Aussie Moore Man
x *olivaceus* = Canary
x Phyllis = Aussie Philman
x Pinkhart = Heartlight
x *serrulatus* = Colonial Rose
x Shooting Star = Devils Tower
x Southern Cross = Long Star
x *spathulatus* = *Parachilus Perky*
x *Susan* = James Woolf
x Weinhart = Aussie Weinman
x *weinthalii* = Weinhart

Rhinochilus:

x *Rhinerrhiza divitiflora* = *Rhinochilus* Dorothy
x *Rhinochilus* Dorothy = *Rhinochilus* Vera

Sarconopsis:

x *Phalaenopsis amabilis* = Sarconopsis Lavinia

Plectochilus:

x *Plectorrhiza tridentata* = Plectochilus Richard Jost

Ira Butler's first hybrid, *Sarcochilus* Canary (x *olivaceus*), gave an indication of things to come from this line of breeding. However, it was his second hybrid, *S.* Fitzhart (x *fitzgeraldii*) which excited the native orchid world, for here were plants that were easy to cultivate, vigorous and had better flower presentation with larger flowers than the parents. These characteristics have continued to be expressed with later hybrids between *S. hartmanii* and other *Sarcochilus* species. In general, *Sarcochilus hartmanii* has improved flower size and plant vigour, while allowing the colours of many of the other parents to come through. Thus, an exciting range of solid colours, from whites, through pinks to reds, greens and yellows, sometimes with interesting spotting and markings on the petals and labellum, are becoming available as hybridists explore the use of selected clones of *S. fitzgeraldii, S. australis, S. dilatatus, S. spathulatus, S. hirticalcar, S. olivaceus* and *S. hillii* with *S. hartmanii*-based hybrids.

However, it was with the intergenercis that the beneficial characteristics of *S. hartmanii* became more apparent, especially with *Rhinerrhiza divitiflora* where *S. hartmanii* greatly extended flower life while retaining the exciting shape and brown to orange bars and yellow colour of the other parent in creating *Rhinochilus* Dorothy. When used with *Phalaenopsis amabilis*, a small, *Phalaenopsis*-shaped, white flower was created, but the plants inherited some of the cool growing characteristics of *S. hartmanii*, providing bushhouse growers with a *Phalaenopsis* look-a-like that will grow cooler than other members of the *Phalaenopsis* genus. Recombining the *Sarcochilus hartmanii*-based intergenerics with *S. hartmanii*-based *Sarcochilus* hybrids would be an interesting line of hybridisation to follow. However, it is possible that the primary and secondary intergeneric hybrids will produce few viable seed and many dry gullies may need to be followed before success is achieved.

Sarcochilus weinthalii **Bailey** (Plate 5)

History

Clements (1989) states that *S. weinthalii* was collected by F. A. Weinthal from the Main Range, Queensland, on 10th September, 1903. Plants were sent to F. M. Bailey who described it in 1903, naming it after its collector. In 1967, Dockrill created a new genus, *Parasarcochilus* Dockr., and moved *Sarcochilus weinthalii, S. spathulatus* and *S. hirticalcar* into this new genus. More recently, Clements (1989) has moved all three back into the genus *Sarcochilus*.

Description

Dockrill (1969) provides a complete description of this species under the name *Parasarcochilus weinthalii* and readers are referred to that work for a comprehensive record. Only a brief description is given here.

Sarcochilus weinthalii is a strict epiphyte, growing on rainforest trees and trees and shrubs of the closed, dryland forests of the Great Dividing Range and coastal spurs between the Richmond River district of north-eastern New South Wales and the Blackall Range in south-east Queensland. Dockrill (1969) states that the northern limits of its distribution are unknown. Throughout its range, it is a rare orchid.

When not in flower, the plants closely resemble those of *S. falcatus*. Plants are erect to pendulous, with 1–5 stems in small, dense clumps. The stems are up to 10cm long and carry 5–10 yellowish green leaves 3–9cm long. Thick fleshy, white to cream roots arise from the leaf axils of the lowermost leaves and ramble widely over the branches and trunks of supporting trees and shrubs. One to four inflorescences arise from the axils of the lower leaves. The inflorescence is 2–10cm long and carry 3–12 flowers. The flowers are 12–15mm in diameter, somewhat cupped in shape, cream to greenish white in colour and irregularly blotched with different sized dull purple, purplish red or brown markings. The flowering season is August to October.

Culture

S. weinthalii is one of the more difficult subjects to grow well, or even maintain in cultivation for any extended period of time. Although a strict epiphyte in nature, it can be grown either mounted or as a pot subject. However, in all instances, very perfect drainage and excellent air movement are essential if the plant is to be maintained in a healthy, flourishing condition. It does not appear to appreciate being disturbed once it has became established and the more permanent the mounting material or potting mixture the better. Some success has been obtained using old, weathered, hardwood palings as mounts, but care must be taken to ensure that the base of the plant can dry out rapidly after watering or falls of rain. For this reason, it is best not to mount the plant on a pad of water absorbent material such as sphagnum moss or the like.

If *S. weinthalii* is to be grown as a pot subject, very shallow terracotta saucers are advisable. A coarse bark and charcoal compost is best with the plant being positioned on top of a mound of compost, rather than being potted within the compost.

In nature, *S. weinthalii* prefers the inner branches and trunks of its host. Hence, it grows better when given 70–80% shade.

The more successful growers of *S. weinthalii* keep this species on the drier side throughout the year and grow it in covered bushhouses so that they have complete control over the availability of water. *S. weinthalii* is killed quickly by damping off caused by bacterial rots and the fungi *Phytophthora* and *Pythium* and it is quite common to loose, almost overnight, what appear to be healthy plants from these diseases. Regular drenching of the plant with anti-bacterial agents and fungicides that control *Phytophthora* and *Pythium*, may give some protection, but the best remedy seems to be perfect drainage and good air movement.

Use in Hybridisation

Because of its natural rarity and difficulty to maintain in cultivation, fewer hybrids have been produced with *Sarcochilus weinthalii* as a direct parent. This is despite the unusual, spotted pattern of the flowers this plant would appear to offer the discerning hybridist. To date (February, 1993, lists from the I.A.R.O.H.), only five hybrids have been registered with *S. weinthalii* as a direct parent:–

x Cherie = Cherie's Wine
x *falcatus* = Susan
x *fitzgeraldii* = Peach Spots
x *hartmannii* = Weinhart
x Weinhart = Double Wine

The cross, *S.* Weinhart (*S. hartmannii* x *S. weinthalii*), produced plants which were easier to grow and more robust than *S. weinthalii*, but whose flowers retained the spotted characteristics of *S. weinthalii* while being larger in size. These characteristics have been retained in the cross, *S.* Double Wine (*S.* Weinhart x *S. weinthalii*), but the plants and flowers are somewhat smaller than in *S.* Weinhart.

An interesting development occurred when *S. falcatus* was crossed with *S. weinthalii* to produce *S.* Susan (Plate 1). Many of the seedlings flowered with a dusky lavender to bluish suffusion throughout the flowers, while retaining darker brown spotting. Further breeding with selected clones of *S.* Susan has shown that this unique, new colour within the genus has been retained.

While it could be expected that the bluish colour has arisen from the spotting pattern of the original *S. weinthalii* clone, John Woolf (personal communication), who made the cross, believes that the colour may have originated because the *S. falcatus* clone has allowed it to be expressed. He has been using this special clone of *S. falcatus* in other crosses within the *Sarcanthinae*. It will be interesting to follow future developments in the breeding lines from the lavender clones of *Sarcochilus* Susan and the *S. falcatus* parent of these lavender clones, especially when they are crossed into the larger-flowered, white and pink coloured hybrids based on *S. hartmannii*.

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TERRESTRIAL ORCHIDS OF THE BRISBANE FOREST PARK

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This is a follow on of the article published in *The Orchadian* Vol. 8, No. 10, December, 1986 on the epiphytic orchids of the park.

As I no longer live in close proximity to the park, visits are not as frequent. Usually when I am going to attend a night time meeting in Brisbane I will spend the day in the park, which is useful for comparison with species located in the hills behind the north coast. It was only last year that I located a number of previously unrecorded terrestrial orchids from the park.

Acianthus

Are represented by two species: *A. exsertus* and *A. fornicatus*. These two species often grow together, are widespread, occurring in a variety of habitats. The most common being the steep stony southerly slopes of the open forest country or along the more moist southern slopes of creeks or depressions. On one occasion a log, hollowed out by fire, in which the charcoal was barely visible for *A. fornicatus*.

Caladenia

This genus is well represented, favouring the more open, drier country, often being seen in the shaley roadside cuttings.

C. alata — Is a rather small flower first located growing in a clump of *Dendrobium kingianum*, further investigation has located a considerable colony nearby, growing in mosses and lichen on shallow gravelly soil and in shallow rock pockets on the southern slopes, often where stunted leptospermum occur. Some 500m from the original location, another colony exists which has quite a number of white forms. I believe this is a new northerly recording for this species. The odd thing is my son collected this species on Moreton Island only a week prior.

Caladenia carnea — This spring flowering species has been hard to locate, when seen, its bright pink flowers have stood out against the bare shaley ground. It has only been seen on four occasions.

C. carnea var. *gracillima* — Varies from *C. carnea* by its lack of barring on the labellum, it has only been seen on one occasion.

C. catenata — Is by far, the most common species of *Caladenia* seen over a wide area of the park. They consist of the usual variations from pure white with a green tinge in the labellum to white with varying shades and amounts of pink to almost straight pink.

Caladenia caerulea — A recent discovery of a single plant of this blue flowered species was surprising, as this species, I am lead to believe, favours the drier western slopes of the Dividing Range.

C. aff. *picta* — This species needs much research. It is quite common in south-east Queensland. Easy to identify, the column is quite well marked with anything from two to five pair of horizontal red bars divided down the centre of the column and lacking the red bars on the labellum. Occasionally I have seen these fused together to form an impressive solid red blotch. In one location a spike with two flowers consisted of one with the red bars and the other with a solid red blotch. The colours vary from pure white to varying amounts and shades of pink. This species commonly grows among *C. catenata*.

Calanthe

C. triplicata — Is common and widespread in the closed forest around creeks and moist gullies. The root system travels along the ground under the decaying leaf litter, ensuring a constant supply of nutrient. This is a situation quite common in south-east Queensland.

Caleana

C. major — Is located at 600m altitude in shallow gravelly soil, on the southern shady side, near the peak of one of the mountains. In this open forest area it is quite common. Surprisingly enough I cannot locate it on the surrounding peaks of similar altitude and vegetation.

Chiloglottis

C. sylvestris — The only species which I am prepared to put a name on at present. This species occurs in similar situations as the *Acianthus* species and is very common over a wide area of the park. I believe there may be another two new species from the park, still under review. Included are three photos by S. Crane of some of the variations which occur within one patch. (Plates 4, 6 and 7).

Corybas

C. barbarae — A relatively new species, named from south-east Queensland in 1988. Previously confused with *C. aconitiflorus* which has a red flower where as *C. barbarae* has a very pale pink, almost white, hood. This species favours open forests on the southerly slopes, which seem to retain moisture. It is very common and widespread, not only in the park, but over south-east Queensland.

C. hispidus — Another species named from south-east Queensland in the late 1970's. This is a very showy species closely resembling *C. fimbriatus* with which it had been confused. It is quite easy to separate the two by the white labellum which has a distinct notch in the upper part. Favouring moist but well drained locations around gullies in open forest on steep southerly slopes.

Cryptostylis

C. erecta — The lone species in this genus recorded from the park. Favouring the open forest, although sometimes found in the woodlands. I have often noticed it growing near an old log or tree stump. This species consists of a creeping rhizome and is not deciduous like the majority of terrestrial orchids.

Dipodium

D. variegatum — A common and widespread species in the park. Flowering at almost any time of the year. Being a saprophyte it is easily seen when in flower. The only chance of locating it at other times is by an old dry flower stalk. The intensity of colour in these flowers appears to vary, one location showed a striking flower, all white with a dark red spot on the tip of each petal. A pure alba form was also seen.

Diuris

D. sulphurea — Occurs spasmodically over a wide area of the park in open grasslands and woodlands. Relatively easy to locate when in flower, otherwise almost impossible in the long grass. In this area *D. sulphurea* has quite a variation in the intensity of colour.

A local identity remembers how, when a child, he and his brother would pick pink *Diuris* by the handful, to take home to their mother. He took me to where he remembers collecting them, but we were unable to find the pink ones.

Gastrodia

G. sesamoides — Another saprophyte, with limited time to locate, due to the lack of leaves. This species has only been seen once but no doubt, if you are in the right place at the right time, there are others.

Geodorum

G. densiflorum — The juvenile plants of this species are easily confused with *Liparis habenarina*. It has been seen in some dry, hot locations on the western side of hills, in a very hard, dry, clay creek flat.

Microtis

M. parviflora — A species which does not seem to have suffered from man's interference. Located on a number of occasions along roadside banks where moisture is retained. Also recorded from a number of locations on the side of the bitumen roadway where the local council mows regularly.

Paracaleana

P. minor — Was located on the same peak on which *Caleana major* was found. This species favoured a more open situation, occurring in the shallow rock pockets, where stunted leptospermum occurred spasmodically.

Pterostylis

Is the most common genus of terrestrial orchid in the park. Much research is required within this genus, particularly as many unusual and interesting observations have been recorded.

P. acuminata — Easily recognisable by its very long and protruding labellum. Recorded from several locations occurring as small scattered colonies, generally on the ridges in very open situations.

P. baptistii — A widespread and common species, occurring in roadside cuttings, open forest and the closed forest. Like most *Pterostylis* it favours the southerly aspect. It has a prolonged flowering period when compared with some *Pterostylis* species.

P. curta — An interesting species which would appear to differ slightly from its southern type form. The flower is fractionally smaller with only a slight twist to the end of the labellum, in some cases you have to look twice to see if there is any twisting. It is quite common in the open forests and in gullies in the woodlands.

P. erecta — A species named by T. E. Hunt from Cedar Creek. This creek drains some of the parks hills. It is quite common in the damper locations along gullies, depressions, walking tracks and roadside banks.

P. hildae — One of the smaller species. I have only once located what I believe to be the true *P. hildae*. In a location adjoining the park it is quite common. Throughout the park the flower appears to differ in size. This is another area to be researched in the future by our learned friends.

P. nutans — A common species which would appear to have the widest distribution of any *Pterostylis*. Often growing into large colonies covering many square metres. It frequently occurs in the woodlands, in very bright light, a much more open location than the other *Pterostylis*. This species flowers over a long period; one of the first to appear, in early April and still flowering in mid-September.

P. ophioglossa — This terrestrial favours the more open and drier country. It has been seen in road cuttings growing in clay and shale. In one of these locations, when road widening took place, one saw thin flat tuberoids the size of a one cent piece, rather than the round pea size tuberoids normally seen; caused by growing between the layers of shale. *P. ophigolossa* in the majority of cases are in varying shades of green, only in two locations have I seen the brown form.

The next group of *Pterostylis* belong to the cauline leaf group. The flowering stem coming straight from the ground and has leaves scattered up the stem. A rosette appears on non-flowering plants only.

P. grandiflora — With its big maroon hood standing out, this is a most spectacular species. The colour of the Queensland *P. grandiflora* is much more striking than the dull southern forms I have seen. I have in a considerable number of cases noticed where *P. grandiflora* is present so is bracken fern.

P. obtusa — An early autumn flowering species, widespread in numbers, locations and type of habitat. The flower appears to have some variation in the length of the dorsal.

P. grandiflora x *P. obtusa* — A natural hybrid which as far as I can determine has not been previously recorded. A single flower spike was located growing among some *P. grandiflora,* only 10m away was *P. obtusa.* I have only been able to locate the one plant from which two flowers have been preserved in spirit and drawings carried out. The flower has kept the broad hood of *P. grandiflora* but of a lighter colour. It has the long galea of *P. obtusa* and a similar labellum.

P. russellii — Another species named by T. E. Hunt from Cedar Creek, near Samford. This species has proved to be widespread in the open forest and merging woodland. Has been confused with *P. decurva.* There appears to be some variation in the species which is being looked into.

P. aff *longicurva* — A new and as yet undescribed species which was located in 1985 and at this point in time only three locations have been recorded, all within the park. The type of country in which it has been recorded is very steep and stoney, the sort of place you can do considerable damage to the countryside just by traversing it. This is where you take three forward steps and four back. An autumn flowering species, the flower having a very open front, light green in colour, turning to shades of red as it ages.

Spiranthes

S. sinensis — Another species which does not seem to have minded man's interference in its habitat. It will show itself in many Brisbane lawns if left unmowed at the right time of the year. Around Maleny the open dairy paddocks support big colonies, this country was, at one time, genuine rainforest where I believe this species would not have existed.

Thelymitra

T. nuda, or a more recently named species *T. fragrans* — One of two species of the commonly called sun orchids recorded in the park. Quite common on and around a number of the peaks, occurring among *Dendrobium kingianum,* as they both flower at the same time and both are in shades of pink, it is quite easy to miss this flower.

T. pauciflora — The second sun orchid, I have only seen this on one occasion. Self pollinating with the flower not even opening, if it did I blinked at the wrong time.

My thanks go to M. Clements and D. Jones of The National Botanic Gardens, Canberra for verification and identification of material over the past years.

Looking for terrestrial orchids is the sort of thing you do the day after looking for epiphytes, it helps bring your head back from pointing skywards. Unless you can find a very good eye doctor, I am still looking for one who can convert my eyes to work in the same way the African lizard, the Chameleon, is able to, one up and the other down at the same time, then I can look for both epiphytic and terrestrial orchids at the same time.

GERMINATION OF *PTEROSTYLIS ARENICOLA* – AN ENDANGERED GREENHOOD FROM SOUTH AUSTRALIA

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Abstract *Pterostylis arenicola* is an endangered, solitary greenhood orchid from South Australia. Its habitat has been largely cleared, leaving three remnant populations of just over 300 plants in total. These populations were threatened by introduced weeds, rabbits and human activity. A mycorrhizal fungus was isolated from the stem of plants collected from Tailem Bend and was successfully used to symbiotically germinate seed in vitro. Optimal germination rate was observed when seed was incubated in darkness at 23°C. Developing protocorms were transferred to outdoor growing conditions in early winter and rapidly became established in pots. The techniques developed here will be used to reintroduce plants into their native habitats as part of ongoing recovery plans for this species.

Introduction

P. arenicola M. Clements et J. Stewart, the sandhill greenhood orchid, was recently described as a new species (Clements, 1989), having previously been referred to as *Pterostylis* sp. 3 or as *Pterostylis* sp. nov. aff. *boormanii*. It is a solitary, tuberous terrestrial herb, having a basal rosette of leaves which are usually senescent at flowering. The plant is deciduous after fruiting and underground tuberoids continue the life cycle after an annual period of dormancy. Tuberoids contain an apical bud which produces a new stem during late autumn and flowering occurs between September and December (Bates and Weber, 1990) with seed maturing progressively between November and December.

While previously confused with *P. boormanii, P. arenicola* has longer lateral sepals with a less pronounced rim than the former. Furthermore, *P. arenicola* has less hairy margins to lateral sepal bases, a relatively large labellum compared with the width of lateral sepals and prominent setae on the basal lobe of the labellum (M. A. Clements, pers. comm., 1992).

P. arenicola was listed as endangered by Briggs and Leigh (1988) and appears to be endemic to South Australia. An earlier collection from Wyperfield National Park, Victoria, has since been identified as *P. xerophila* (J. Briggs, pers. comm.). More recently, Leigh and Briggs (1992) recorded *P. arenicola* as occurring in Victoria following the discovery of a single plant near Berrook, north-north-west of Murrayville. This plant was found in 1989 and 1990 by Jeff Jeanes who also photographed it in flower. On the basis of this colour slide, M. Clements identified the plant as *P. arenicola* (R. F. Parsons, pers. comm., 1992). However, Dean Rouse, comparing this slide with others showing plants from the type locality at Tailem Bend, felt that (a) the labellum of the Victorian plant seemed to have a more acute indentation, (b) the S.A. plants held their hoods at a higher angle, and (c) the S.A. plants had larger areas of white striations on their dorsal sepals. He concluded that the Victorian plant was somewhat different from the S.A. plants and may constitute some kind of hybrid (R. F. Parsons, pers. comm., 1993). Therefore the status of the putative Victorian population awaits further clarification.

In South Australia, *P. arenicola* is largely restricted to semi-arid areas under *Callitris preissii* trees on red sand dunes or sandy loams. Only three distinct populations of this orchid have been confirmed to date, amounting to less than 1% (estimated on basis of pre-settlement habitat remaining) of the original population size (Bates and Weber, 1990). Two of these populations occurred within 700m of each other at the type locality in a Wood and Forests Reserve south of Tailem Bend in the Murray Mallee and comprised approximately 200 and 36 plants respectively, covering a total area of about 1ha. These populations were threatened by their small size, by soil disturbance due to rabbit diggings and by weed invasion (*Myrsiphyllum asparagoides, Oxalis pes-caprae* and *Avena* spp.).

The third population consisted of about 100 plants under a 0.01ha patch of *Callitris preissii* on the Grange Golf Course in metropolitan Adelaide. This land forms part of the rough for the golf fairways and trampling by inaccurate golfers, weed invasion (mainly *Oxalis pes-caprae*), browsing by hares and golf course maintenance activities were among potential threats (Davies, 1992). While the current management committee is aware of the rarity of this plant and sympathetic to its conservation, attitudes may change as committee membership and funding priorities fluctuate. Collection of plants and seed, together with loss of habitat have also contributed to the decline of all populations.

Recently (1992) a putative new population of *P. arenicola* was located in the Coorong National Park, but accurate identification and determination of the extent of the population awaits flowering later this year.

Isolation of Mycorrhizal Fungus

Mycorrhizal fungus was isolated from *P. arenicola* plants collected at Tailem Bend in 1991. Soil was gently prised away from roots and dead leaves were removed. The thickened region of underground stem (the collar) immediately below the rosette of leaves was excised and sterilised by washing in running tap water for two hours, followed by shaking in 20% sodium hypoclorite (NaOC1) for five minutes. Stem segments were rinsed twice in sterile distilled water and serial transverse sections (approximately 0.5mm thick) were sliced using a sharp blade. These sections were plated onto fungal isolating medium (Clements, 1982) and incubated at 20°C in darkness. Fungal growth emanated from sections within four days and the fungus was subcultured on oatmeal medium (0.25% blended oatmeal, 1.2% agar) to obtain a pure culture (isolate P221).

Seed Germination

P. arenicola seed was sterilised in 1% NaOC1 for five minutes. A drop of Triton X–114 was added to assist wetting of the seed. Seed was spread evenly over sterile filter paper and excess solution removed under vacuum using a buchner funnel. The filter paper and seed were placed onto the surface of oatmeal medium (in petri dishes) pre-inoculated with fungal isolate P221. Symbiotic germination was compared with asymbiotic germination on modified Burgeff's Pa5 medium (Collins, 1989) without fungal inoculum. Petri dishes were incubated under the following environmental conditions:–

(a) 18/10°C (12 hr photoperiod)
(b) 18/10°C (continuous darkness, 12 hr thermoperiod)
(c) constant 23°C (16 hr photoperiod)
(d) constant 23°C (continuous darkness)

Germination was assessed regularly by estimation of the stage of protocorm development using a scale of 1–5 (after Wilkinson et al, 1989) as follows:–

1 = seed coat intact
2 = seed coat cracked, protocorm swelling
3 = seed coat shed, rhizoids developing
4 = start of shoot differentiation, numerous rhizoids
5 = tip of first leaf greening.

Protocorm development from seed was faster under symbiotic than under asymbiotic conditions. Stage 5 protocorms were produced within 90 days at 23°C under 16 hour photoperiod in the presence of P221, whereas asymbiotically germinated seed had only reached stage 2 in this time (Fig. 1). Incubation temperature and light both played important roles in regulating germination rate. At 23°C in darkness, stage 5 protocorms were produced within 43 days, while under 16 hour photoperiod, equivalent protocorms took 92 days to develop. Germination rate was markedly lower under alternating temperatures of 18/10°C, whether in darkness or under 12 hour photoperiod.

Protocorms developing in darkness or in light were found to differ in their shoot gravitropic response depending on the light regime. Protocorms which developed in darkness exhibited normal negative gravitropism of the shoot, while those incubated under light (16 hour photoperiod) demonstrated positive shoot gravitropism. This phenomenon may have important ecological advantages for protocorms which develop on the soil surface and requires further investigation.

Seedling Establishment

Stage 5 protocorms which had developed symbiotically in vitro, were planted just below the surface of steam sterilised

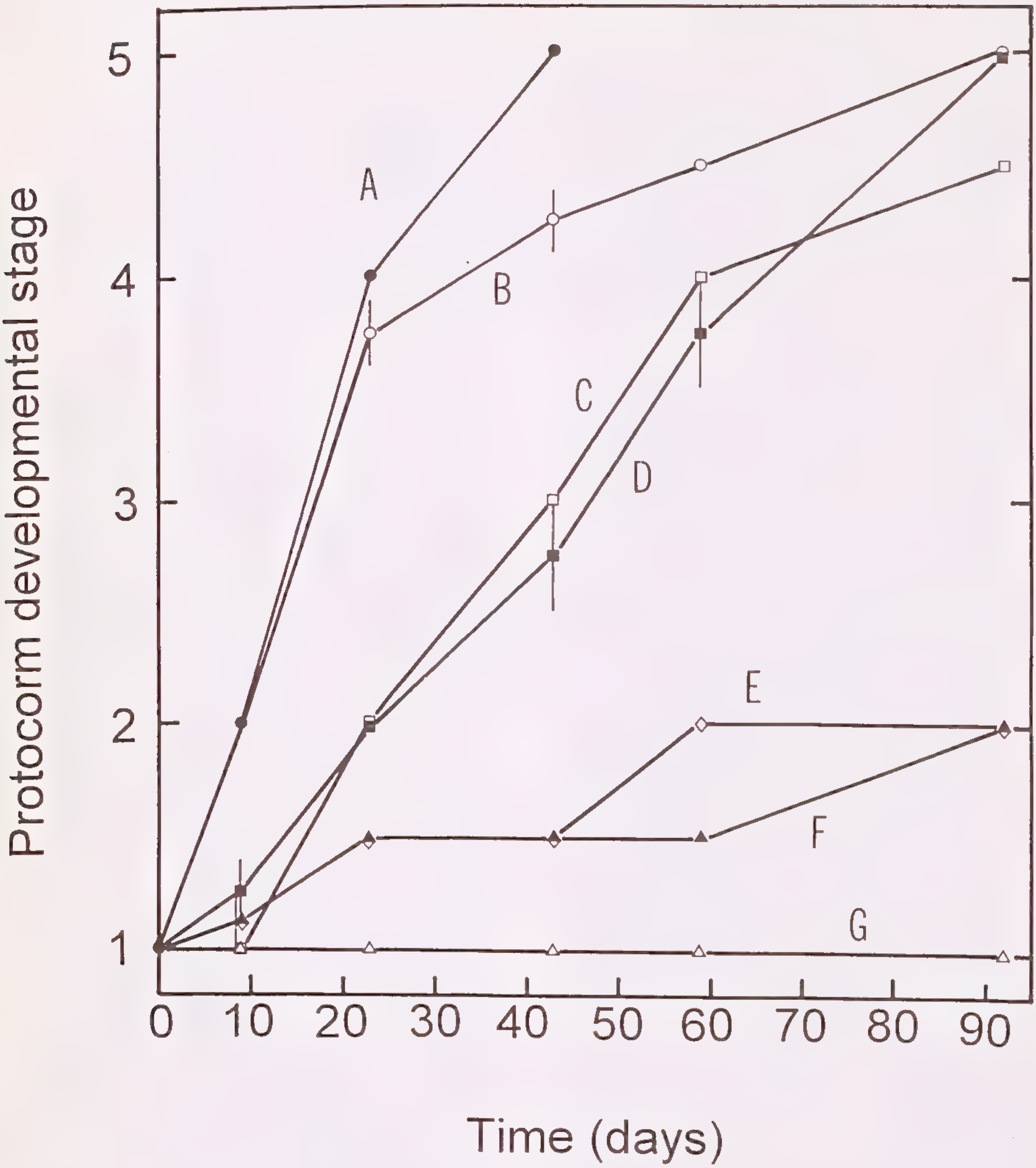

Figure 1: Germination of *Pterostylis arenicola* seed under symbiotic (A, B, C, D) or asymbiotic (E, F, G) conditions in the dark (A, D, F), under 16 hour photoperiod (B, E) or under 12 hour photoperiod (C, G). Incubation temperature was 18/10°C with a 12 hour thermoperiod (C, D, F, G) or 23°C (A, B, E). Vertical bars represent ±SE. Error bars not visible fall within the symbol.

Plate 8: Habitat of *Pterostylus arenicola* at Tailem Bend showing *Callitris preissii* overstory and encroachment of *Myrsiphyllum asparagoides*.

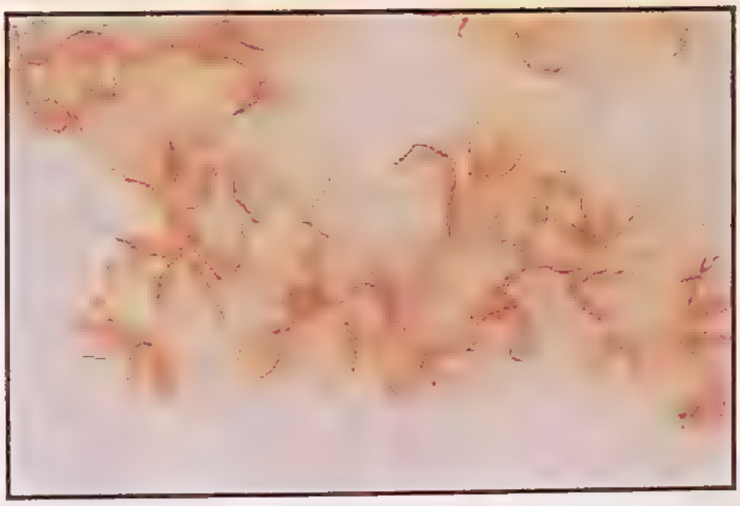

Plate 9: Stage 2 protocorms of germinating *P. arenicola*.

Plate 10: Stage 5 protocorms of germinating *P. arenicola*.

Plate 11: Seedling of *P. arenicola* showing emerging leaf.

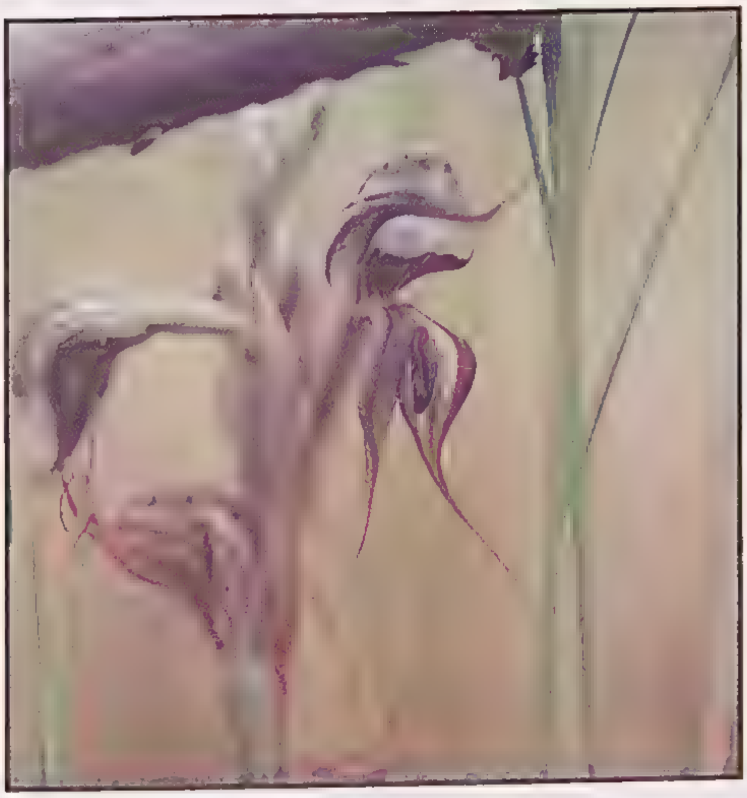

Plate 12: *P. arenicola* flowers in October.

Plate 13: *P. arenicola* and associated grassy weed flora at Tailem Bend.

Plates 8 to 10 and 12 M. Jusaitis, Plate 11 B. Sorensen.

potting soil (scrub sand: peat moss: sharp river sand, 4:3:2) in 1.1 litre pots and placed outdoors under 70% shade in June, 1993. Protocorms developed rapidly, with leaves appearing within two weeks. Average plant survival after 30 days was 81%.

Tuberoid Multiplication

P. arenicola is a member of the rufa group of greenhoods, which generally replace their tuberoids annually, but without any increase in number. Of eight pots containing solitary plants cultured during 1991, only two were found to have twin tuberoids, the remainder produced single replacement tuberoids. Where two tuberoids were produced, one was markedly smaller than the other. Tuberoid removal from four plants during September, 1992 did not yield a significant increase in the total number of tuberoids produced by the end of the growing season. Thus tuberoid multiplication appeared to contribute only in a minor way to population increase, supporting the field observation that this species was not a colony-former but a solitary species.

The experiments reported here were performed during the research phase of recovery plan implementation aimed at conserving *P. arenicola* in its native habitat. The seed germination techniques described will be used to raise plants for reintroduction to augment existing populations following threat abatement.

Acknowledgments

We gratefully acknowledge the financial support of the World Wide Fund for Nature Australia and the Endangered Species Programme of the Australian Nature Conservation Agency.

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RIMACOLA ELLIPTICA – THE GREEN ROCK ORCHID

David Titmuss
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If you take a walk along the undercliff track at Wentworth Falls in about October or November, taking care to view the coral ferns, sundews and other epiphytes growing from the cracks above your head, you may be lucky enough to spot a plant bearing green pointed flowers. This is *Rimacola elliptica*, sometimes called the Green Rock Orchid.

The average Sydneysider (even the average orchid enthusiast) has probably never seen *R. elliptica* except near a few well trodden paths in the Blue Mountains. W. H. Nicholls stated (*R. elliptica*) was "apparently confined to the Blue Mountains area". Its true distribution is (or was) the Sydney sandstone basin extending to and including the Blue Mountains across to Mt Wilson. The holotype was reported by Rupp as having been collected from Middle Harbour. Probably the major stronghold in Sydney for this plant is along the ridge extending roughly north-south through Terry Hills and St Ives along the Mona Vale Road.

First described by Robert Brown in 1810 as *Lyperanthus ellipticus*, because the elongated, pointed flowers bear a superficial resemblance to those of *L. suaveolens* or *L. nigricans*. However, this is where any real similarity ends. But despite the obvious differences, it was not until 1871 that Reichenbach moved the species to the genus *Caladenia*, a choice hardly better than the first. It was not until 1942 that H. M.

R. Rupp created a new genus and gave the plant the name by which we know it today.

"Rimacola" means crack or fissure dwelling, "elliptica" refers to the elongated, ovoid shape of the radical leaves. *Rimacola elliptica* is very selective of its habitat. Precisely the right conditions must prevail or it will not survive. Almost without exception this orchid grows on south facing rock surfaces. This shields the plant from the heat build up which (in summer at least) would kill it with a north, west or even easterly orientation. The rock boulders must also have a seepage of water **through the core of the rock.** This is important, providing moisture and mineral nutrients and keeping the rhizome of the plant at a constantly cool year round temperature. Even though the rock face may be totally dry in midsummer, the slow but constant seepage will keep the plants sufficiently cool.

Where conditions are right for any plant to occur, it is likely one will find a number of the plants growing in the yellow clay along the horizontal fault line(s) of the rock. If the geology is right this can stretch for some considerable distance. But there is nowhere where the number of plants is abundant. Even a short distance away from a colony of orchids on a seemingly identical rock face, none may be present. This is for one of few reasons. The first is that the microclimate may be missing one vital element, the second is the shortage of pollinators and the third may be prevailing winds blowing seed away from otherwise adequate habitats. One learns to appreciate R. D. FitzGerald's sentiments: "This is a very rare orchid, very capriciously distributed".

Reg Angus, a very astute and knowledgeable observer of orchids around the Sydney area has concluded that a real decline in pollinator numbers has led to the species becoming very rare today. To support this argument he has compared the number of seed capsules in plants he pollinated by hand to their next door neighbours left to the caprices of their insect friends, the difference was nothing short of convincing. In the hand-pollinated plants, there was close to 100% of flowers setting seed, compared to an average 3–4 seed capsules per plant with insect-pollinated plants.

As with most native plants today, the biggest long term threat (and one which also destroys the pollinators) is loss of habitat. Unfortunately some of the most fashionable addresses in Sydney are perilously close to the last remaining habitats of *R. elliptica*. Sadly, also, people still try to collect this plant, only to find that it is impossible to grow. Once the rhizome is damaged (as it inevitably is) by removing it from the rock, the orchid will die. So please, enjoy this very rare orchid when you see it, but leave it where you have found it.

I would like to express my thanks to David Banks and Stephen Clemesha for their advice and especially to Reg Angus who has always been ready to unselfishly share the knowledge gained from his labours in the bush.

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DENDROBIUM ANNE'S RAINBOW (*D.* AUSSIE ANGEL X *D. SPECIOSUM)*

J. T. Woolf,
P.O. Box 7011, Toowoomba, Qld. 4352

This cross was made in 1991 by Issy Klein of Melbourne. The seed was sown by Florafest. Many seedlings resulted and some 300 were kept to grow and flower.

The pod parent resulted from a cross by Phil Spence of *D.* Aussie Ira x *D. bigibbum. D.* Aussie Ira being *D.* Ellen (*D. kingianum* x *D. tetragonum*) x *D. tetragonum.*

D. Anne's Rainbow grows extremely well making flowering size plants in two years. In Toowoomba they grow well either in a cold or heated glasshouse and can also be successfully cultivated in a bushhouse. They grow and flower continuously throughout the year.

The range of flower colours includes cream, cream tipped with mauve to bright purple, yellow tipped with mauve to bright purple, overall mauve to overall bright purple. Flowers are large, to 75mm, the darkest clones are smaller. The strong upright racemes carry up to 20 blooms, well spaced and well presented.

A truly superb cross, Mr Klein is to be congratulated.

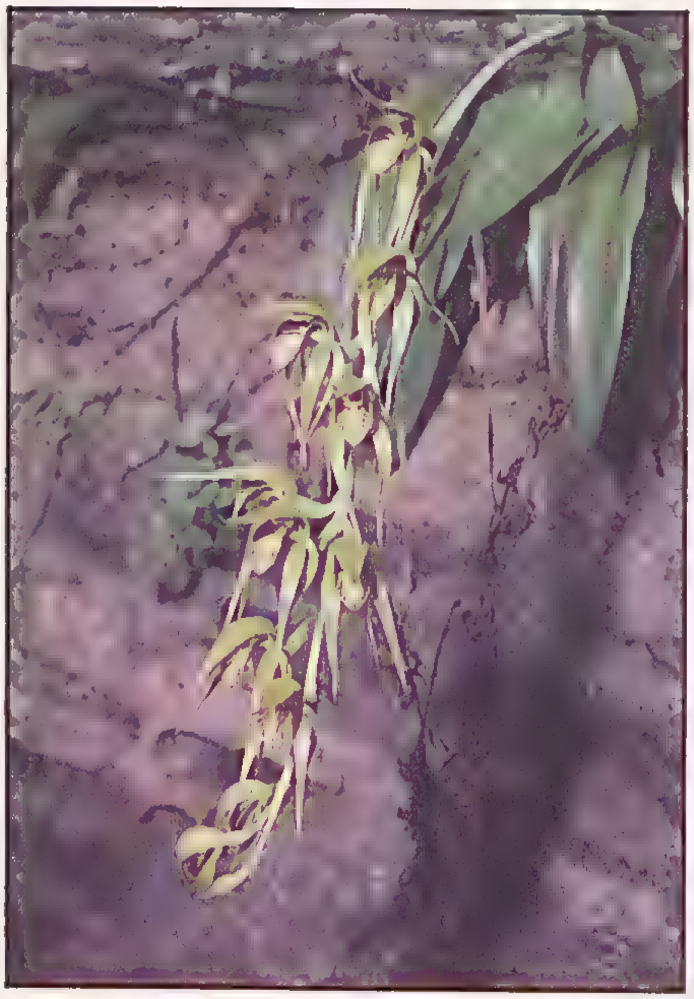

Plate 14

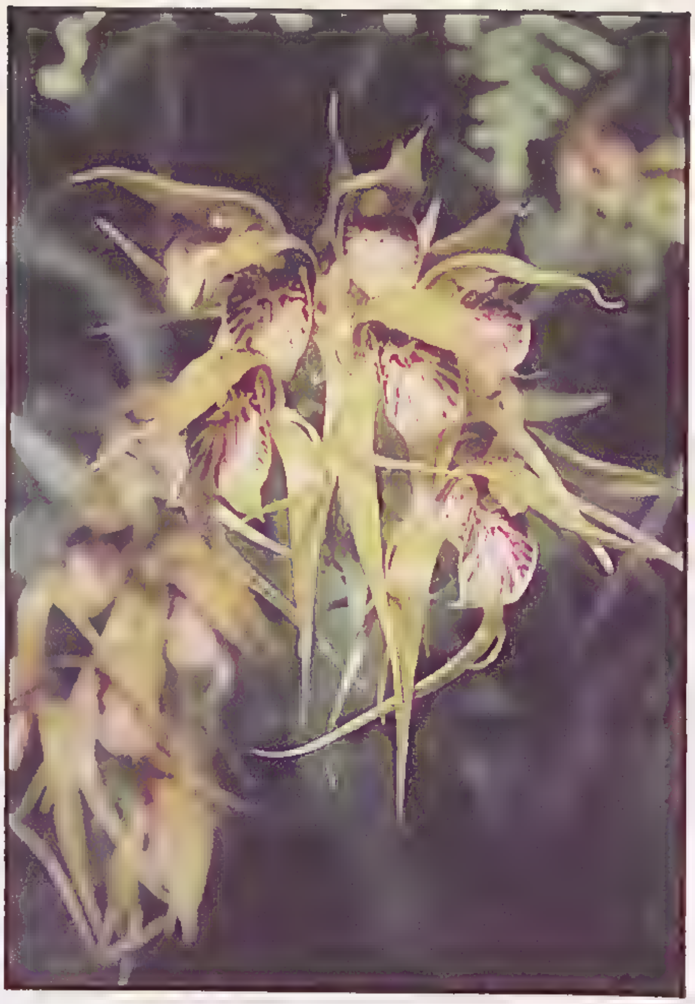

Plate 15

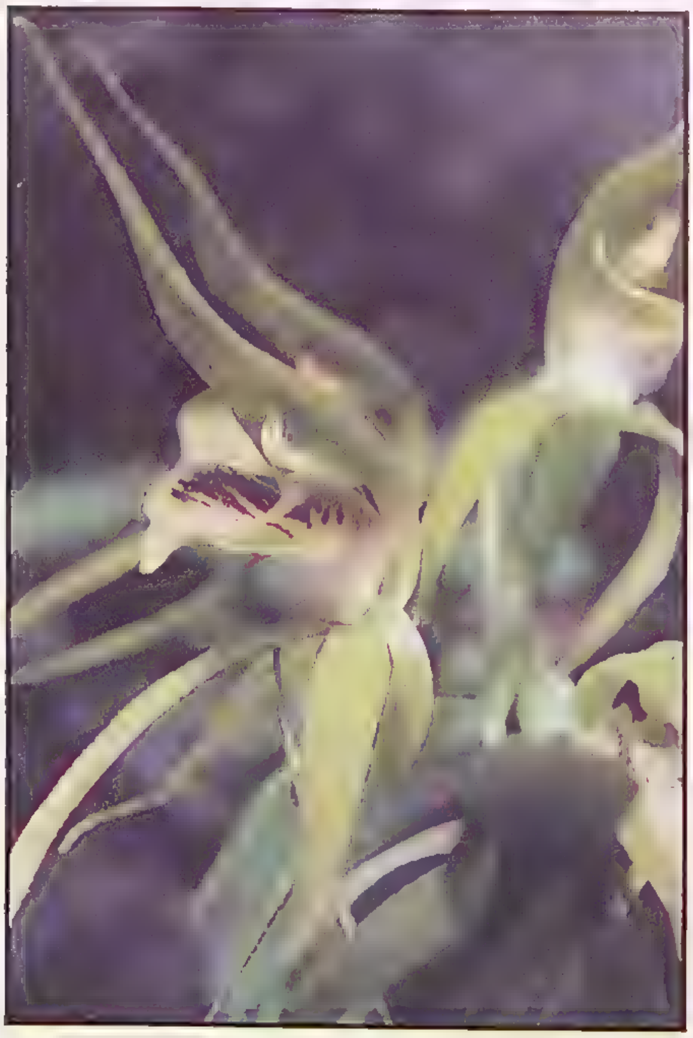

Plate 16

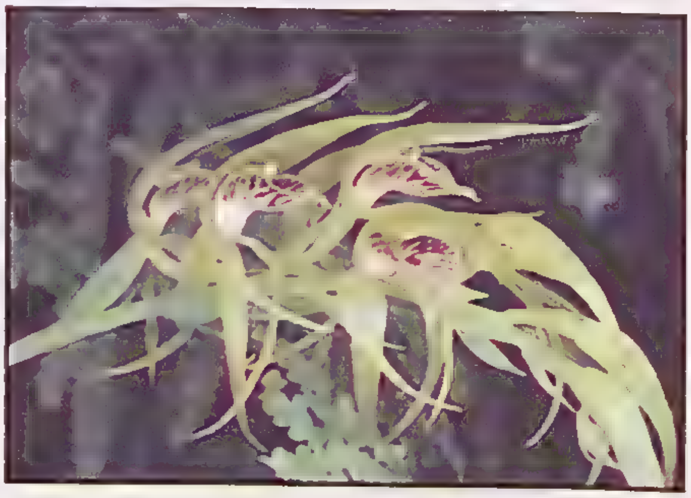

Plate 17

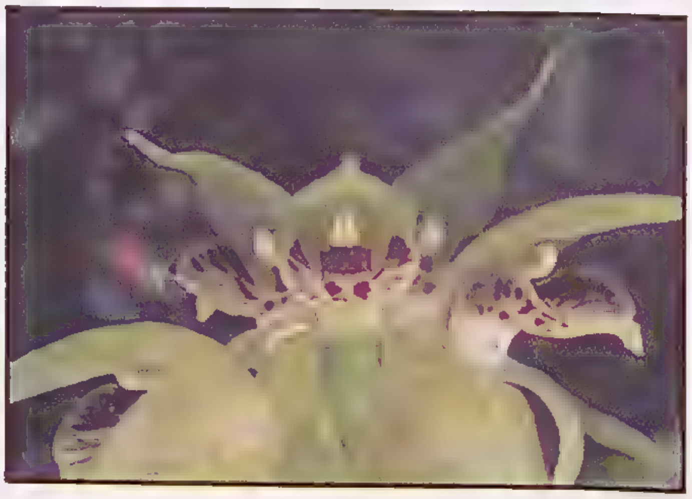

Plate 18

Rimacola elliptica— Plate 14 from Ku-Ring-Gai — Plates 15 to 18 from Galston.

Photos: D. Titmuss.

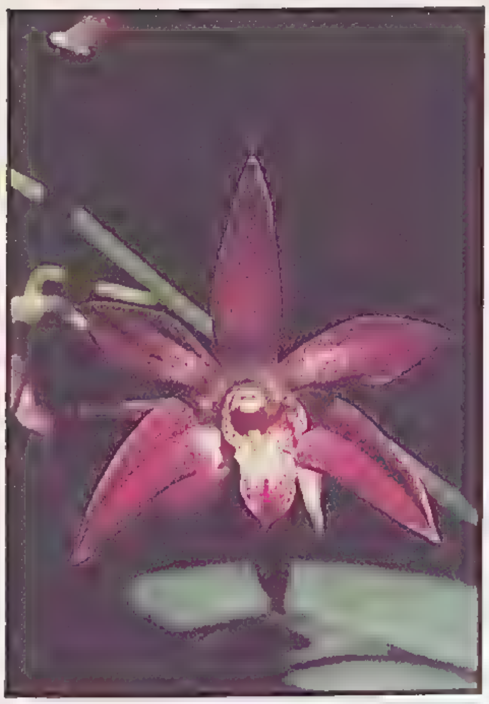

Plate 19: *Den.* Anne's Rainbow.
Photo: J. Woolf

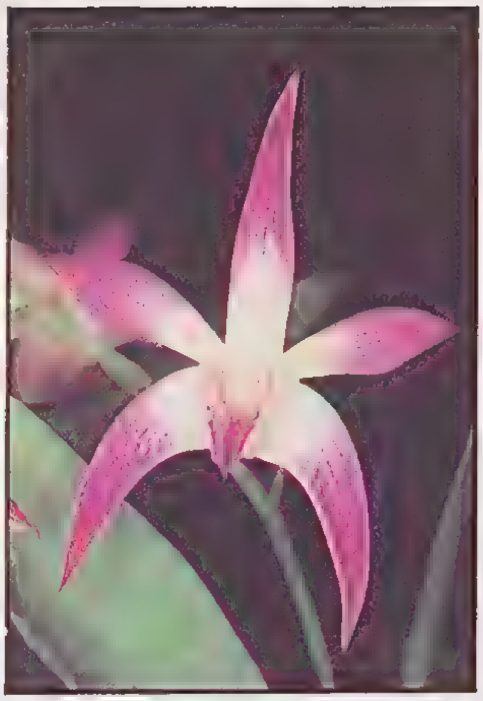

Plate 20: *Den.* Anne's Rainbow.
Photo: W. Harris

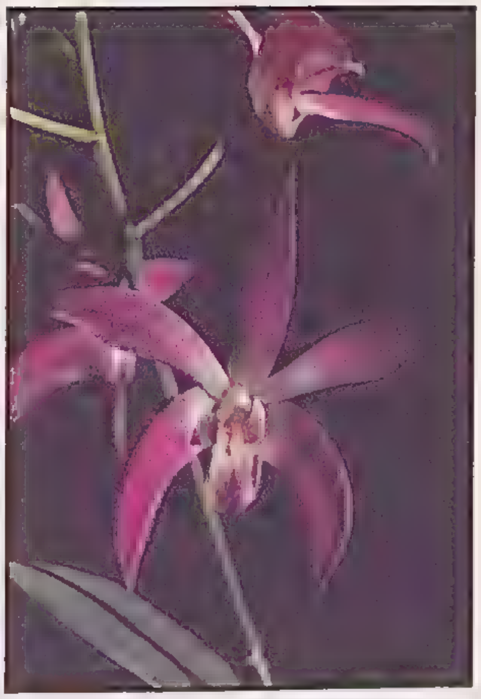

Plate 21: *Den.* Anne's Rainbow.
Photo: J. Woolf

Plate 22: *Den.* Anne's Rainbow. Photo: J. Woolf

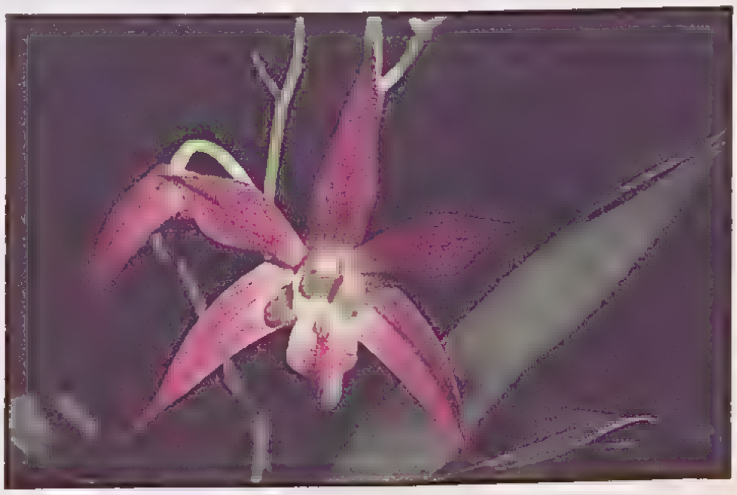

Plate 23: *Den.* Colonial Campio. Photo: J. Woolf

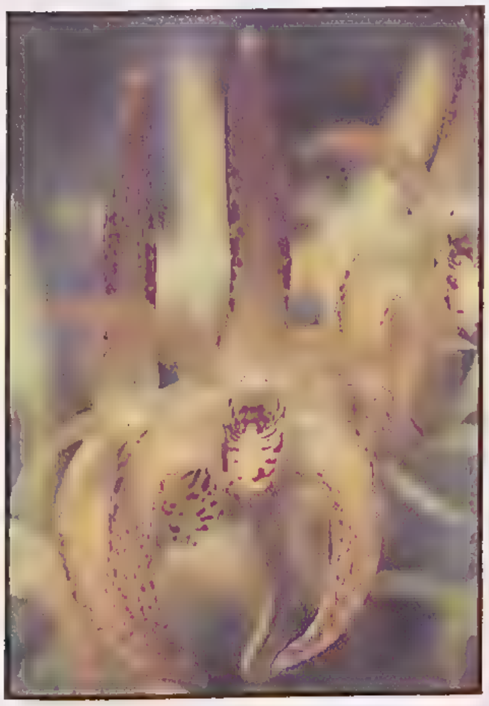

Plate 24: *Den.* Clarrie Wuth.
Photo: J. Woolf

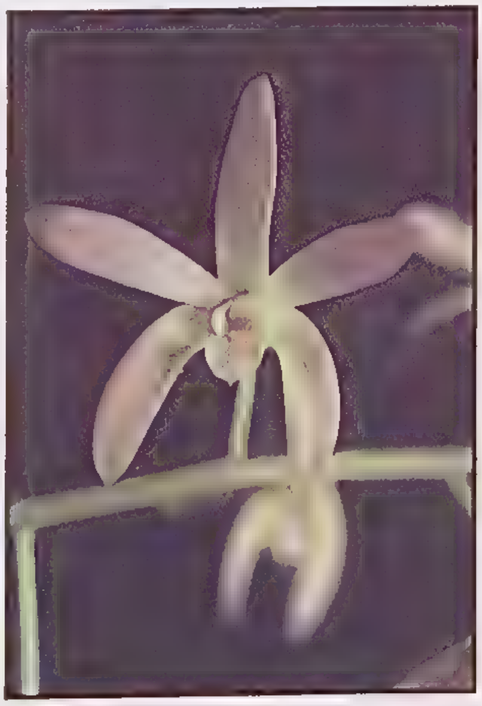

Plate 25: *Den.* Superb-King.
Photo: J. Woolf

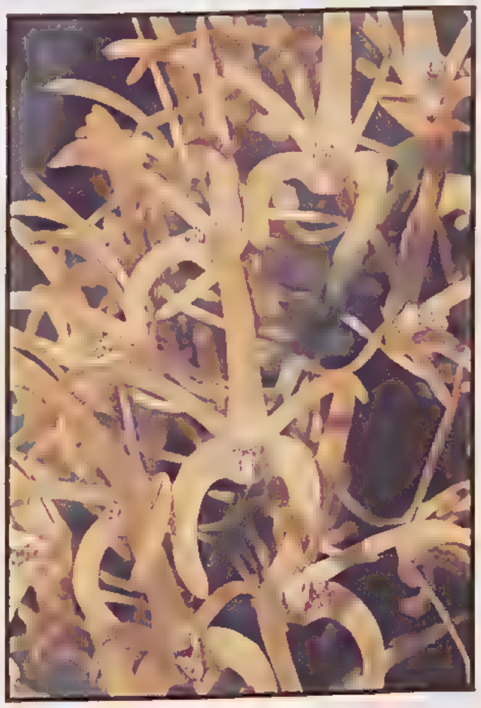

Plate 26: *Den. speciosum*
'Ludlow's Giant'.
Photo: J. Woolf

VANDA HELVOLA – A NEW RECORD FOR PAPUA NEW GUINEA

N. H. S. Howcroft
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Introduction

In a previous paper on *Vanda hindsii* Lindley in New Guinea and Australia, the possibility of a second New Guinea species was reported and discussed (Laverack and Howcroft, 1982). Subsequently further investigations of this entity and comparison with flowers of *V. helvola* Blume acquired from Sabah in Borneo, have led the present author to the conclusion that the second Papua New Guinea species and this species should be considered conspecific:–

Vanda helvola Blume in Mus. Lugd. Bat. 2 (1849) 62; Rchb.f., Walp. Ann. 6 (1864) 867; J. J. Smith Fl. Buit. 6 (1905) 594, f.443; Holttum Fl. Mal. 1 (1964) 716, 3rd ed.; Lamb Orch. Dig. (1983) 95–7. Comber Fl. Java (1990).

Discussion

While studying New Guinea *Vanda* material it was noted that some specimens differed, in a number of features, from those identified as *V. hindsii*. These specimens had a broader column than *V. hindsii* (see Fig. 7A) and they produced a shorter inflorescence with only two to five flowers compared to 10 to 14 produced by the *V. hindsii* specimens (see Figs. 2 and 3; plates 27 and 29). This second New Guinea *Vanda* appeared most closely related to *V. helvola* and flowers of this species were obtained from Sabah to compare with the second New Guinea species.

These comparisons showed that both the Borneo and Papua New Guinea specimens are much the same in all features. Each possessed only three ridges on the labellum compared with five ridges on the labellum of *V. hindsii* (see Figs. 3 and 4). the apex of the midlobe of the labellum of *V. hindsii* is consistently bilobed whereas in the other species it is either blunt or obovate. The leaf tip of *V. hindsii* is always unequally bilobed and rounded on one side, while with the second species the apex is unevenly trilobed or praemorse (see Figs. 6 A–C).

The plant habit is quite distinct between the two with the New Guinea *V. helvola* producing a longer plant with shorter leaves and with hardly any side growth from the base except when the plant has reached a length in excess of 60cm.

Differences between the columns and labella of the two species are compared in scattergrams in Figs. 7A and 7B. Labellum measurements were taken from the point where the labellum is attached to the column to the tip of the midlobe. The width measurements were taken from the widest portion of the midlobe, just before the lateral lobes and mouth of the spur.

Illustrations and a photo of specimens of the Borneo Povenance by Lamb (1983) and colour photos by Comber (1990) suggest that the tepals of the Indonesian and Borneo plants are narrower and the leaves slightly more rounded toward the apex but still unevenly trilobed. However, the Borneo specimens compared in Fig. 4 are quite broad when flattened and close to that of Bulolo specimen 3B in Fig. 5. The inflorescence of the Malaysian species is described as having four to seven flowers (Lamb, 1983). The Papua New Guinea specimens range from two to five and no more than seven. Generally the descriptions suggest that there is some regional variation.

Distribution

Previously known from Peninsula Malaya, Western Java, Sumatra and Borneo. The present paper now extends its range to New Guinea.

At present it is not known how widespread *V. helvola* is in New Guinea. In Papua New Guinea it is known from the Morobe Province, the Southern Highlands and East New Britain. It is throught to extend into the Solomon Islands. No specimens have been examined from Irian Jaya, but it is expected to be found there. In Papua New Guinea the species occurs from around 300 metres above sea level to 1,300m. At present it is not known if it occurs at lower altitudes.

Notes

This species has been often mis-identified in collections as *V. hindsii*. Botanic Garden staff and private collectors who have New Guinea material should check the identity of their plants and particularly if they are using them for breeding.

V. helvola is only known as an epiphyte. In the Bulolo region of the Morobe Province, it is fairly common on hoop pine (*Araucaria cunninghamii*). It also has a range of other native host trees. The species has been observed by the present author to colonise prolifically on the exotic coffee and cocoa shade tree *Leucaena leucocephala* wherever the orchid occurs naturally. Examples of this may be seen near Wau and along the Wampit River in the Morobe Province and in the cocoa plantations near the Warengoi River on the Gazelle Peninsula of East New Britain (Map 1).

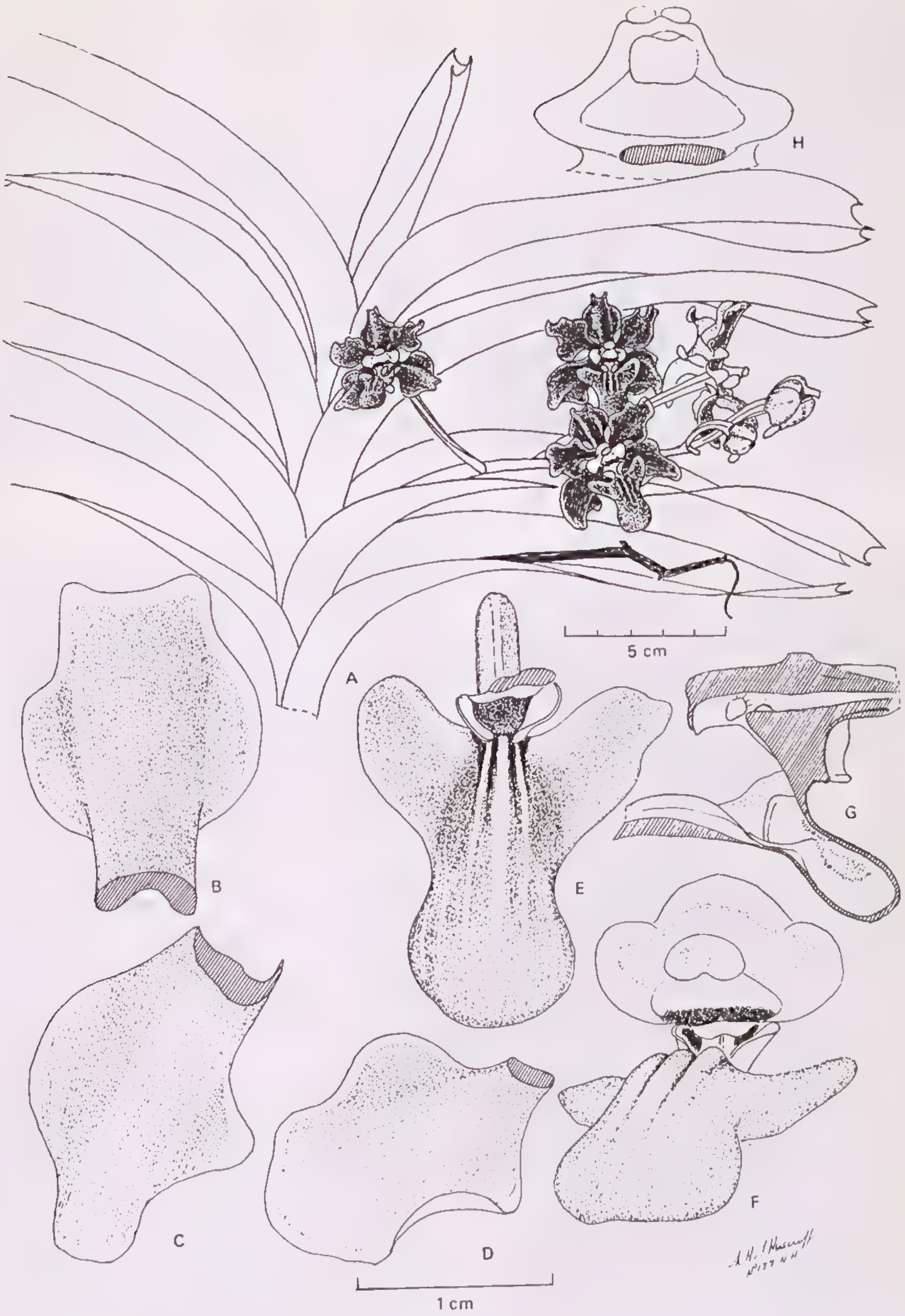

Figure 2: *Vanda helvola* Blume ex Bulolo, P.N.G. — (A) Flowering top section of plant. (B) Dorsal sepal. (C) Lateral sepal. (D) Petal. (E) Labellum shape. (F) Labellum and column, front view. (G) Cut away view of column and base of labellum and spur. (H) Column, ventral view. Anther removed and pollinia exposed. (Specimen in Plates 27 and 30).

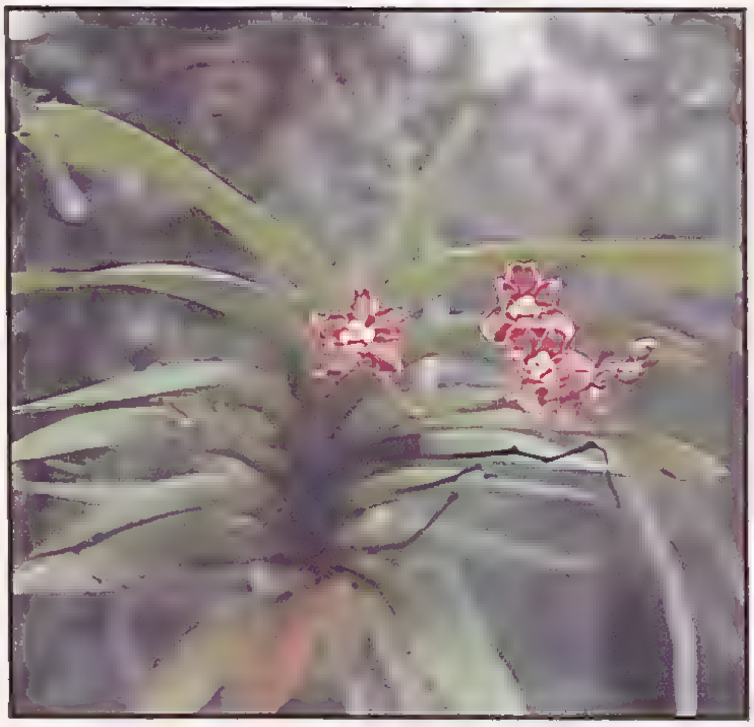

Plate 27: *Vanda helvola* – habit, ex Bulolo, P.N.G.

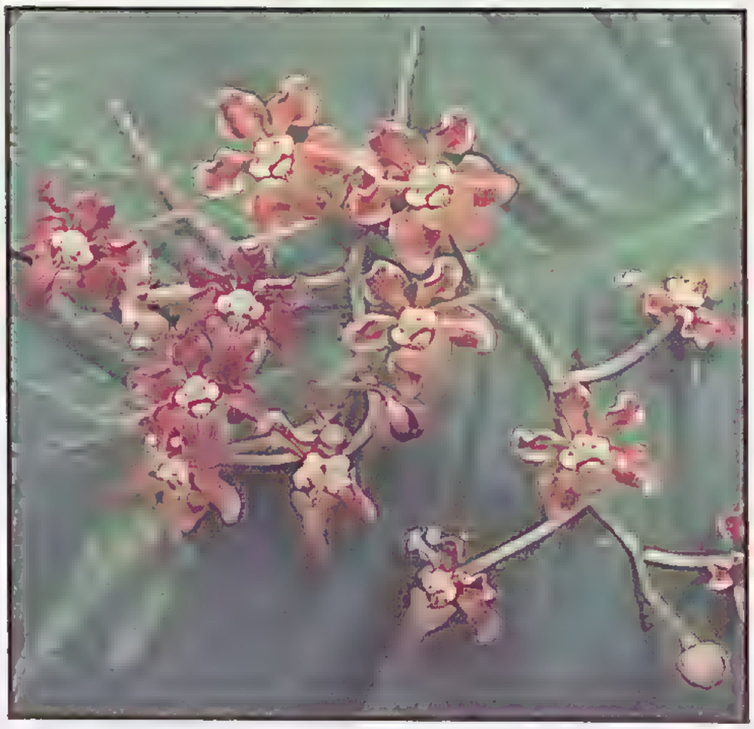

Plate 28: Colour variation in *Vanda helvola* from Bulolo, P.N.G.

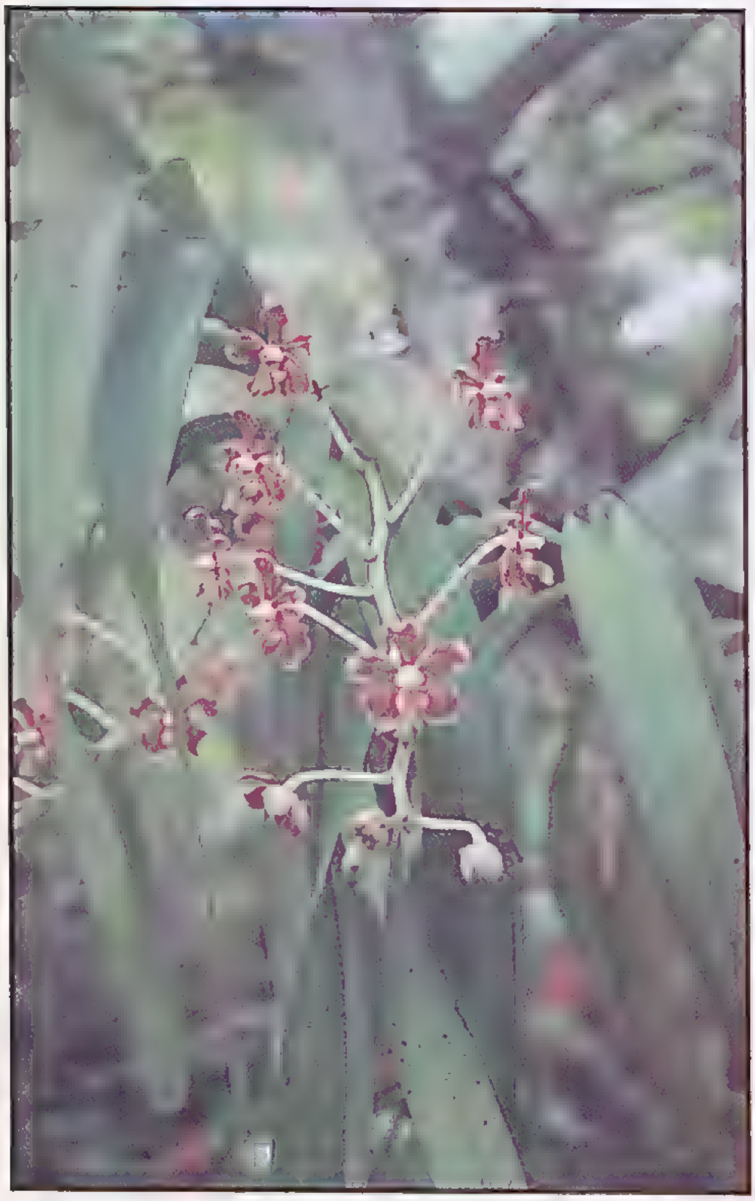

Plate 29: *Vanda hindsii* – habit, ex Bulolo, P.N.G.

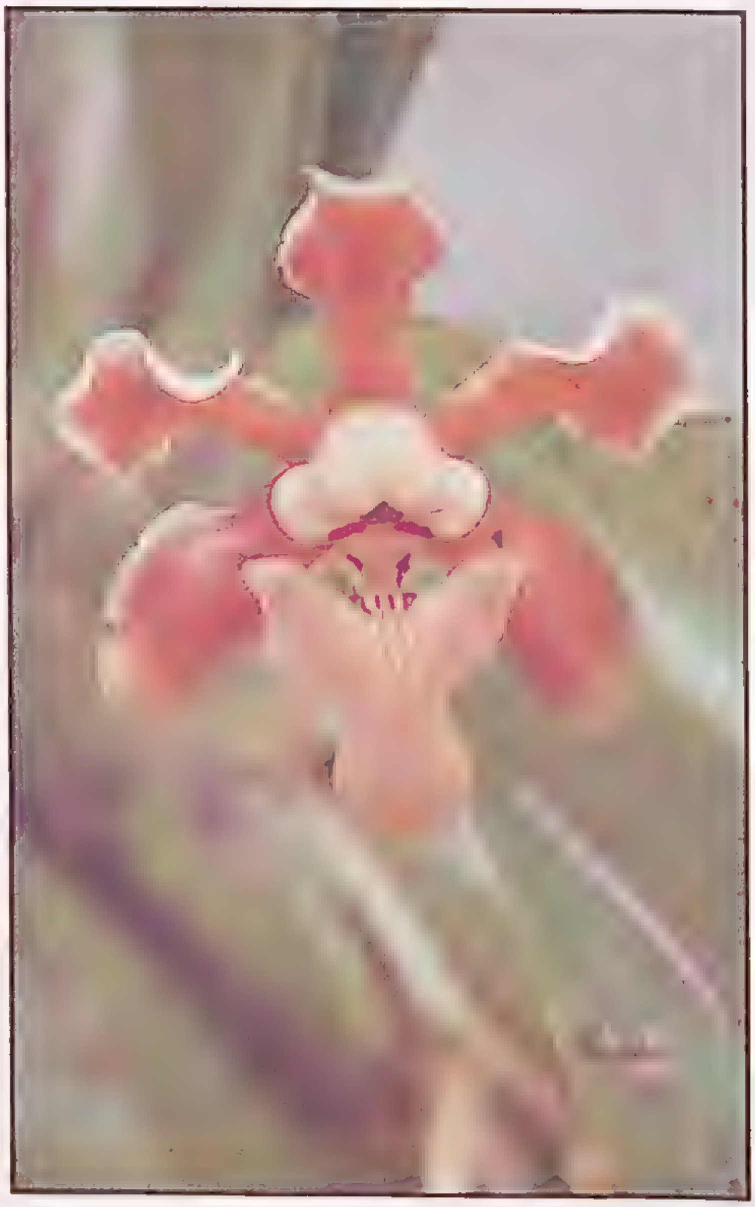

Plate 30: Close up of *Vanda helvola* from Bulolo, P.N.G.

Photos: N. H. S. Howcroft.

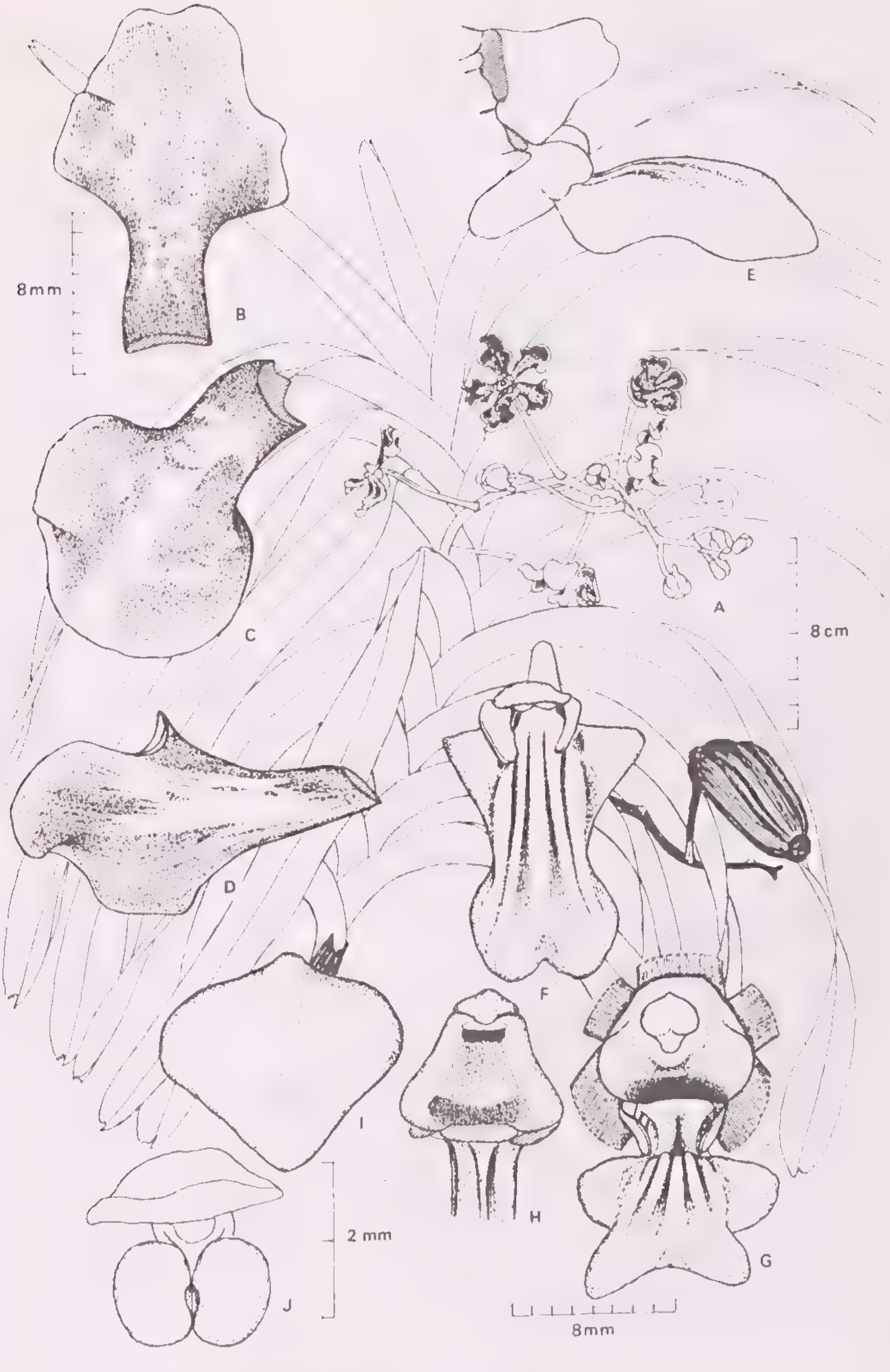

Figure 3: *Vanda hindsii* Lindley ex Bulolo, P.N.G. — (A) Flowering plant. (B) Dorsal sepal. (C) Lateral sepal. (D) Petal. (E) Column and labellum, lateral view. (F) Labellum shape. (G) Labellum and column, front view. (H) Column, ventral view. (I) Anther cap. (J) Pollen.

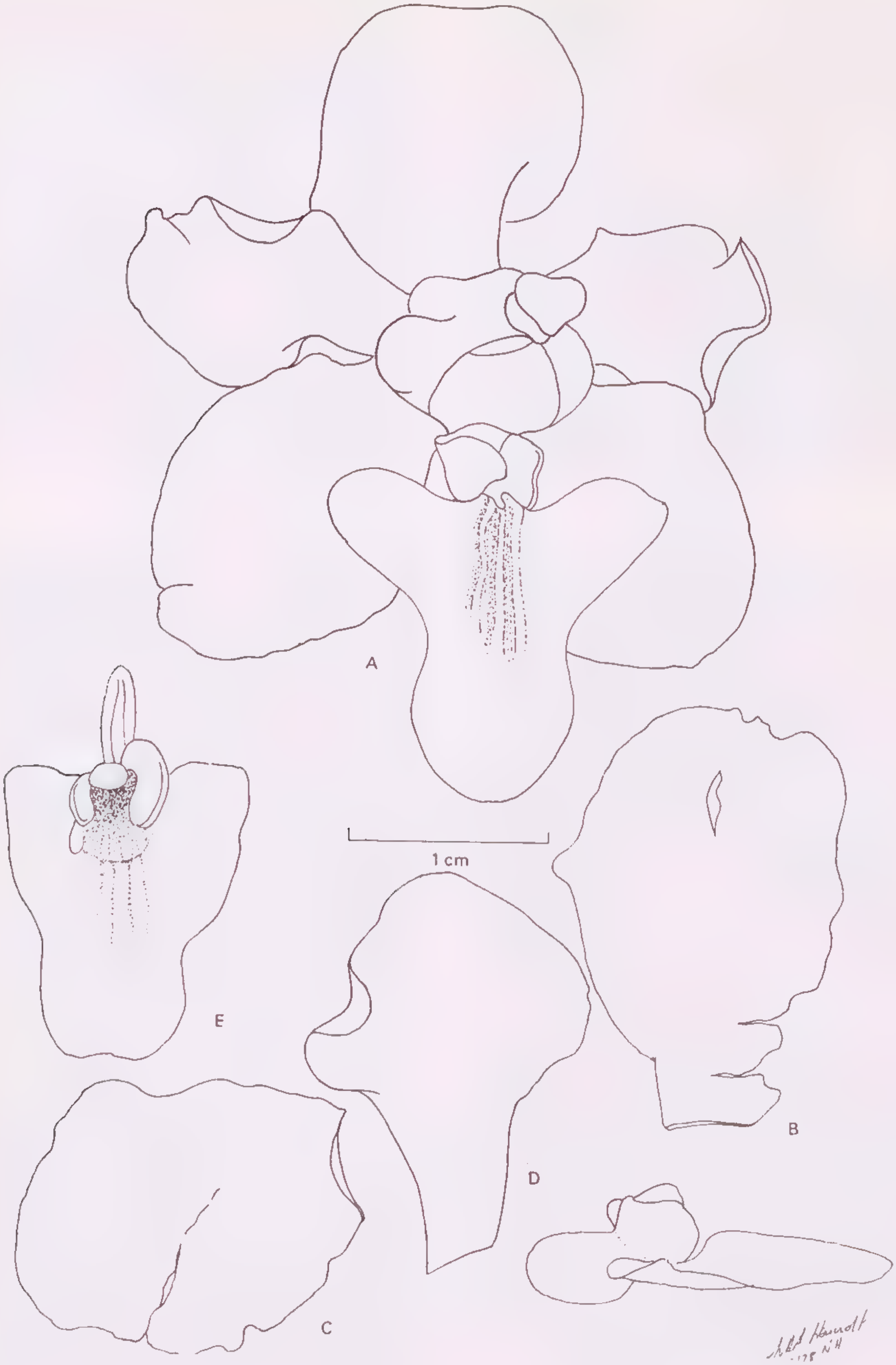

Figure 4: *Vanda helvola* Blume ex Borneo (NH/Lamb 480, Lae) — (A) Rehydrated flower of specimen No. 1. (B) Dorsal sepal (specimen No. 2). (C) Lateral sepal (specimen No. 2). (D) Petal (specimen No. 2). (E) Labellum shape (specimen No. 2). (F) Labellum and spur, lateral view (specimen No. 2).

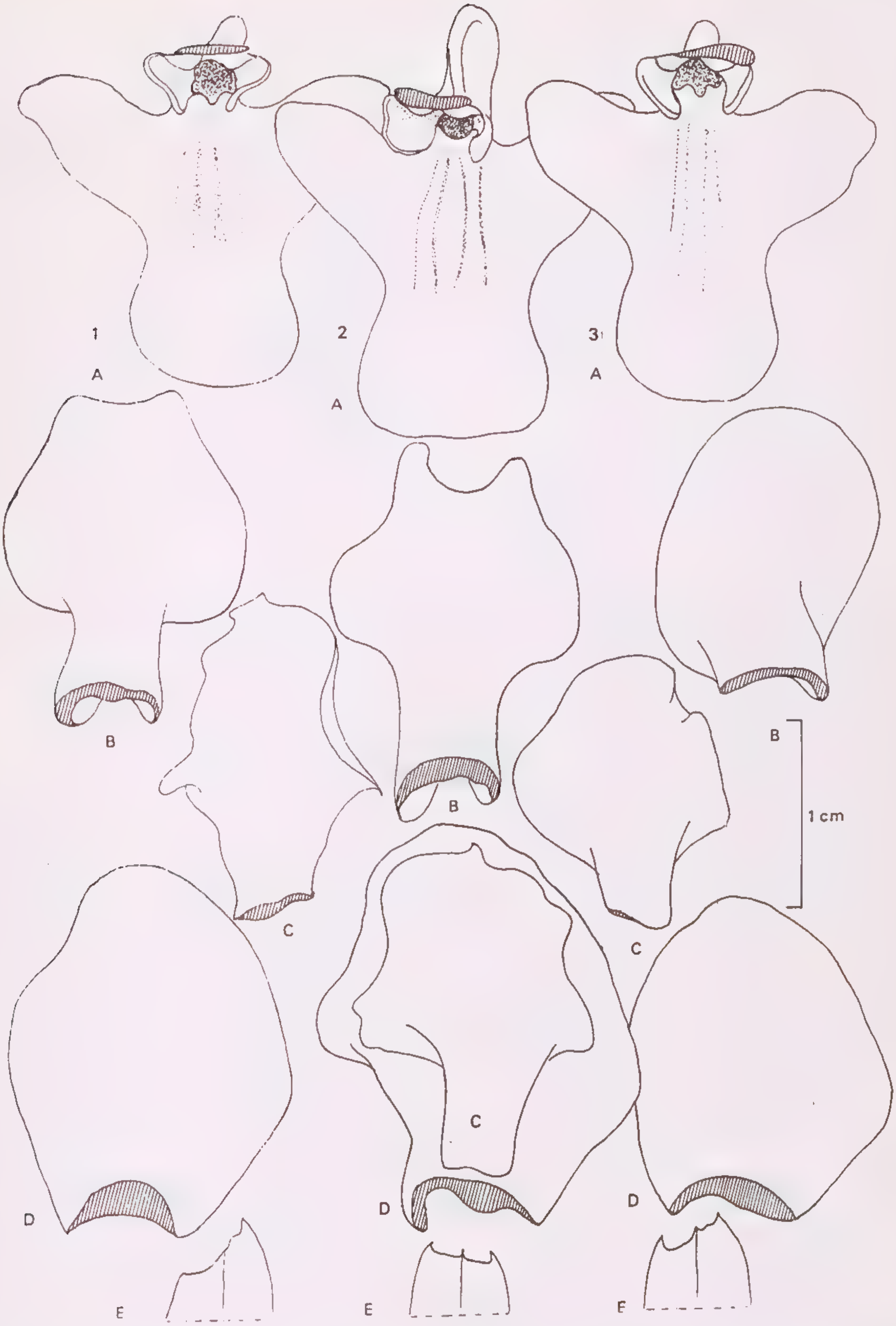

Figure 5: *Vanda helvola* Blume ex Bulolo, P.N.G. — Three samples of Bulolo populations showing some variation. (A) Labellum shape. (B) Dorsal sepal. (C) Petal. (D) Lateral sepal. (E) Leaf tip.

The Wampit River populations overlap with *V. hindsii* and while both generally appear to have close but separate flowering periods, specimens of both species have been occasionally observed flowering at the same time in the one locality.

The flower colour of the species is brown to tan-brown and the margins of the sepals and petals are often yellow. The labellum is usually a lighter brown with some yellow and maroon markings. The column and spur is white (Plates 27, 28 and 30). *V. hindsii* can be similar but usually blotched with yellow (Plate 29). It is also noteworthy that the Gazelle Peninsula populations are all consistently golden yellow in contrast to all the mainland populations that have been examined (Howcroft, 1992).

Flowering: Observed flowering January, February and May in the Morobe Province and in May and June in the East New Britain locality.

Conservation Status: Not certain. Generally the species appears to be able to regenerate very well in the known localities. The Warengoi population on the Gazelle Peninsula is under pressure in the cocoa plantations as the exotic host tree is being replaced. In this situation a salvage and relocation programme is needed. If commercial collecting of wild plants were allowed this unusual Provenance may become endangered.

From the information examined so far, it seems that there is some regional variation in the species and there is a need to assess the extent of this in New Guinea. More information is required about the distribution and conservation needs of the species in Papua New Guinea.

Specimens Studied

Borneo: Sabah specimen, NH/Lamb 480 (Lae).

New Guinea: Bulolo, M. P. Howcroft 370A, 434 to 436 (Lae).

Acknowledgements

This paper would not have been possible without the flower specimens of the Borneo *V. helvola* and additional information on the Borneo Provenance provided by Mr A. Lamb. His help is gratefully acknowledged here. I would also like to thank Mr Max Henderson of Ulatawa Plantation, East New Britain, for his assistance to examine the yellow form of this species in the field and to collect live specimens for the National Botanic Gardens, Lae.

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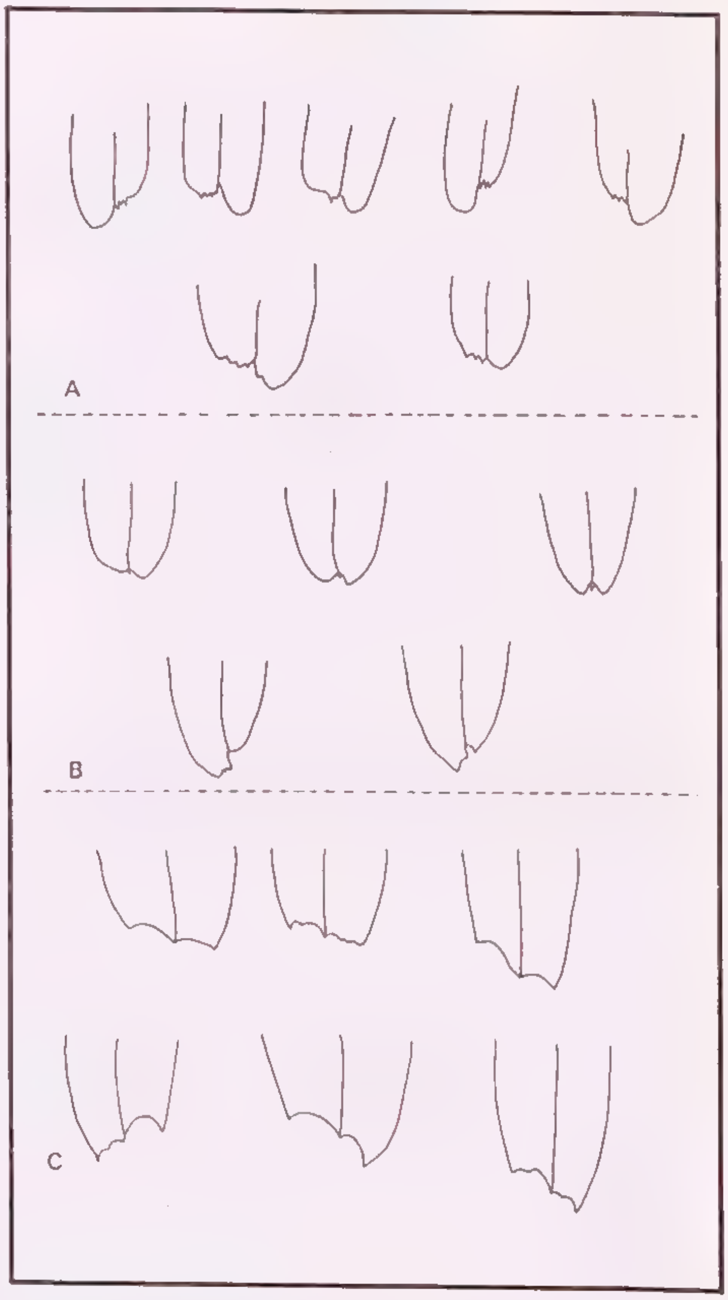


Figure 6: Leaf tips.
(A) Australian *Vanda hindsii*. (B) Papua New Guinea *Vanda hindsii*. (C) Papua New Guinea *Vanda helvola*.

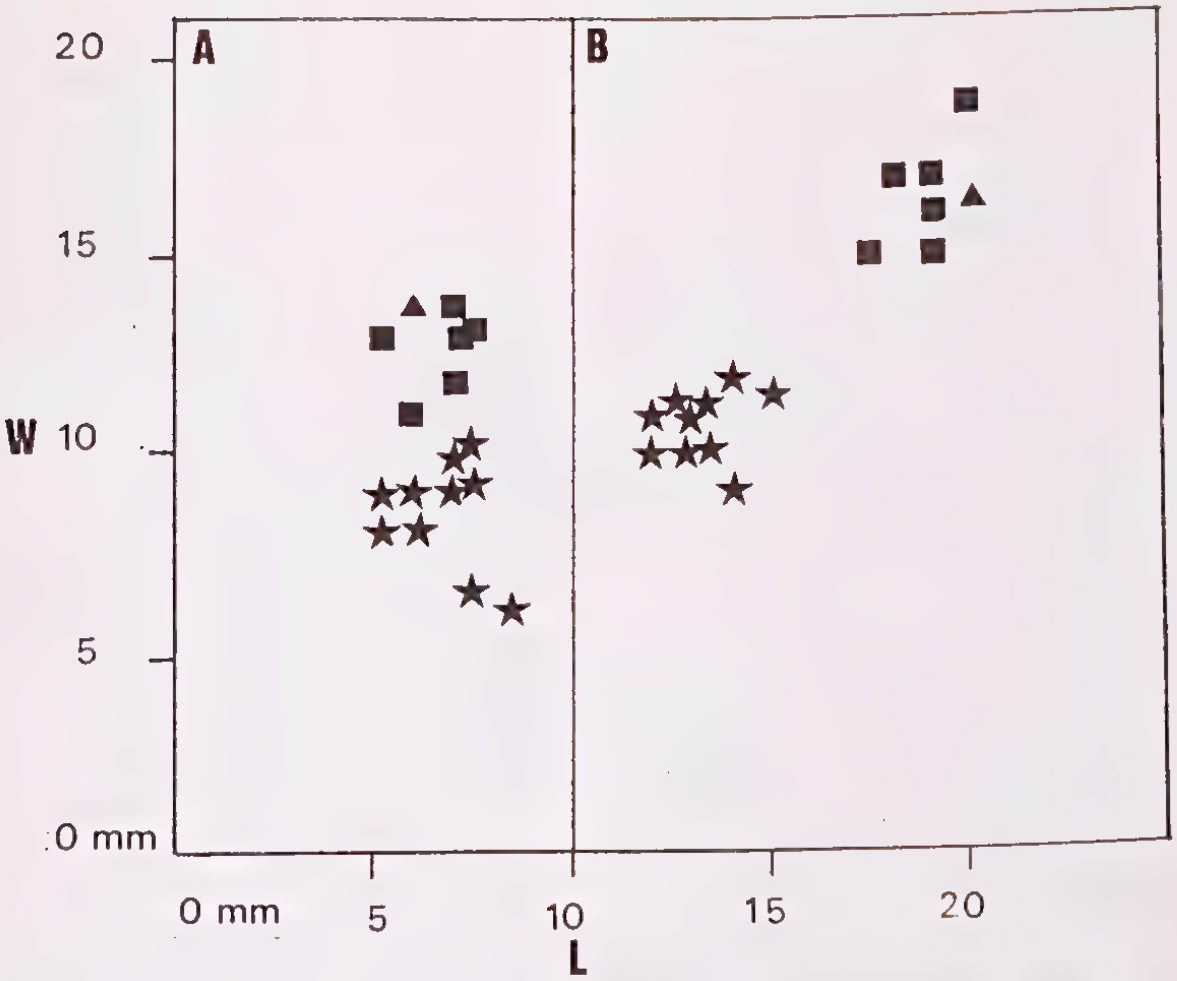
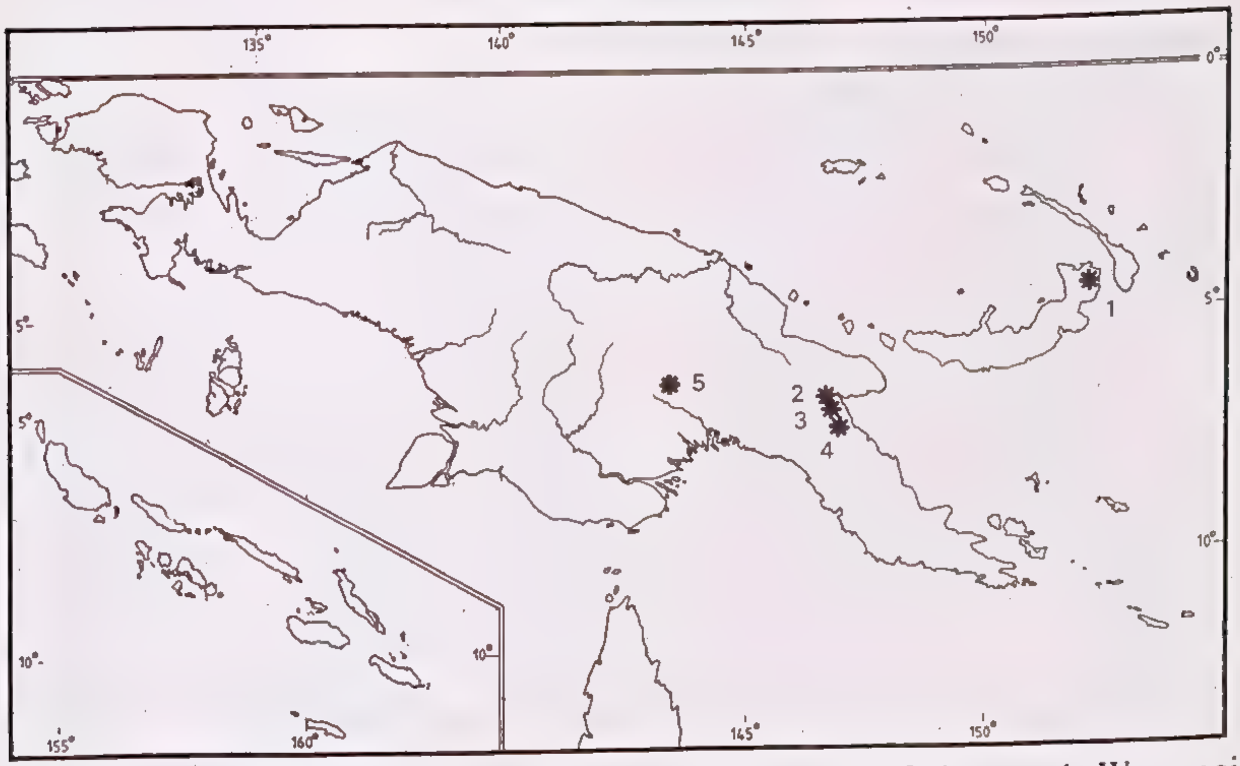


Figure 7: Differences in column and labellum — (A) Column width (W). Column length (L). (B) Labellum width (W). Labellum length (L).

Key to symbols: Square = *Vanda helvola* P.N.G.
Triangle = *Vanda helvola* Borneo
Stars = *Vanda hindsii* P.N.G.



Map 1: Collection localities of *Vanda helvola* in Papua New Guinea — 1. Warengoi, East New Britain; 2. Bundun, Wampit River, Morobe; 3. Bulolo, Morobe; 4. Lake Kutubu region, Southern Highlands.

A TALE OF THREE ORCHIDS

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Any native orchid enthusiast, who has bashed his or her way through the Australian bush often enough, will know exactly what I mean when I state that "Lady Luck" frequently has the ultimate say over the success of most field excursions. But this is not always the case.

There have been plenty of trips that I've taken part in, where the pre-war preparation would put the antics of many self-appointed third-world military leaders to shame. On occasions, I have had the lounge room floor covered with up to six adjoining maps and then stood on a chair to take in the entire picture. If you become experienced enough at reading maps, they can be more revealing than a hundred photos of a given ridge, or valley or whatever. You can develop a sixth sense, an understanding, or an affinity for a region you may never have even been to. You can often work out just what vegetation types you can expect before setting foot in the vicinity. This sort of groundwork is certainly not in the "Lady Luck" category. It is strategy, or research, or commonsense . . . call it what you want.

There have been many, many trips where I've blundered onto really good finds completely out of the blue. A couple of the more notable head-scatchers I've stumbled upon include the only known creek in the vast Blue Mountains region where *Dendrobium tetragonum* grows, approximately 450 plants and they are all of the mid-north coast persuasion to boot — a very strange recording indeed.

Last spring, Denis Johnson and myself found masses of *Bulbophyllum weinthalii* growing near Gladstone, Queensland. That's 400kms beyond its old northern limits if you please. To top that off, while driving back to Sydney feeling pretty pleased about that find, we stopped off at a deep gash in the granite country of New South Wales. In the space of half an hour, we turned up six plants of *Dendrobium* X *gracillimum,* four of *D.* X *delicatum* and two of *D.* X *suffusum.* Some of these rare natural hybrids were secured to the rock face by big clumps of *Bulbophyllum bracteatum,* itself a very uncommon species.

All the planning under the sun could not have predicted such freakish discoveries. These could only be put in the category of "lucky". Better still is a typical Australian colloquialism, which I can't use in a family orchid journal, but is perhaps the most apt adjective that springs to mind.

The following report contains elements of both precision planning and Australian colloquialism, resulting in Denis Johnson and myself spotting the three rarest epiphytic orchid species that occur in N.S.W. — and all in the space of 48 hours.

According to the results obtained from the 1988 N.S.W. Epiphytes Survey (see *The Orchadian* Vol. 10, No. 4, Winter, 1991), the three rarest orchids in N.S.W. are: 1st, *B. globuliforme* (one sighting); 2nd, *B. argyropus* (two sightings); and 3rd, *Taeniophyllum muelleri* (three sightings). I wasn't one of the fortunate few to see them but like most enthusiasts, the desire to cross them from the list of the "most wanted" was very strong indeed. So in late October, 1992, yet another trek to the border country of N.S.W. and Queensland was initiated, the sole objective being to locate *Bulbophyllum globuiliforme* in situ.

For 12 hours we drove through rain squalls that were always constant, frequently torrential. Two hours after nightfall we were close to the selected search area. The plan had been to erect the small tent and cook a meal over an open fire. Fat chance of that now. So we booked into a small motel for the night. Our mood was one of depression — nearly as depressed as the low pressure system pumping rain on to the motel roof. But while we slept the rain dispersed as if by magic. The morning broke chilly and blue and our expectations soared.

Acting on a tip-off, we headed into the high peaks of the McPherson Range, to a particular group of hoop pines where our informant had found pleasing quantities of *B. globuliforme* two years previously. For those readers who may not be familiar with *B. globuliforme*, a few facts and figures should prove useful at this point.

Firstly, *B. globuliforme* is small, real small! Vegetatively speaking, it is Australia's smallest epiphytic orchid, the pseudobulbs being about ½ to ¾ the size of *B. minutissimum*, which nearly all readers would be familiar with. The flowers of each are roughly the same size, meaning 2–3mm across.

But while *B. minutissimum* is quite a common species and grows on everything from mangroves at sea level to several softwood species at higher altitudes, as well as growing extensively on rocks; *B. globuliforme* is far more restricted. It only grows on the limbs of hoop pines and even then, only hoop pines growing in the McPherson Range on the N.S.W.-Qld. border. It was first described by W. H. Nicholls in 1938 — quite recent really.

B. globuliforme is a species that I had searched for all of my orchiding life without even a single tiny bulb coming my way. For years and years, the only piece known to exist in Sydney was a much-revered clump belonging to the late Lloyd Bradford. It grew on a mount of hardwood about the size of a cigarette box and it was collected by Lloyd on the N.S.W. side of the McPherson Range in 1962.

To gaze on that "unique" specimen once a year, usually with its seven to 10 flowers on board, was something akin to Christmas coming around or the tax cheque arriving again. It was an event that die-hard species growers would anticipate for months.

We headed off with great impatience to the designated locality, carefully following all the instructions issued by our kindly mentor. When we reached the proverbial "needle in the haystack" we were indeed excited to find large numbers of mature hoop pines emerging from the lush rainforest. The adrenalin rush was huge as we approached the drip lines of those proud monarchs and began a systematic search of the numerous fallen branches for paydirt. To us, this was no different from prospecting for gold.

Only a few minutes had passed before we began finding a bit of "colour", mainly dead strands of *B. globuliforme* on well-rotted hoop pine limbs. Unfortunately, most of this orchid hereabouts was just that, completely dead. But we gradually began to turn up tiny pieces of "green gold" here and there. The first living bulbs I found, a strand about 6cm long, was carefully removed from its disintegrating host using all the skills of a surgeon. In that early stage of the day's quest, I wasn't to know that within four hours I'd be finding limbs as thick as my arm wrapped in glorious sheets of that tiny and rare species.

We each worked a side of the ridge and sometimes didn't meet for up to an hour. Then we would compare our finds and trade tales about the massive sheets that had wantonly perished for the lack of a caring hand. By the time we returned to the car we were embarrassed by the quantity of this orchid we had "rescued". And rescued is the correct word to describe our activities on that day. The only possible way that anyone could ever hope to observe *B. globuliforme* in the wild would be by emulating our methods. To find it on the ground and then leave it there to wastefully die would be absolutely criminal.

As we poured over the collection of rotting bark and green pieces of hoop pine limbs at our feet, it occurred to me that this may well have been the largest quantity of *B. globuliforme* ever assembled in the one pile — even though it would have all fitted nearly on a kitchen table. We felt privileged and justly rewarded for a well-planned, methodical search for a truly precious gem of the Australian bush.

That afternoon we visited a nearby area where the only notable find was a few dozen specimens of *Sarcochilus hartmannii*, all in bud. It never ceases to amaze me how hard *S. hartmannii* territory can be. At this spot they grew in full sun on a north-east facing cliff, hardly a hint of shade except for some tussocky grass. Their roots were mostly penetrating dry, crumbly soil.

The next day we located several hundred plants of *S. hartmannii* growing amongst ferns in dense shade. These specimens were almost indistinguishable from plants of their close relation, *S. fitzgeraldii*. If they had not been flowering during our visit, we might never have suspected the difference. This utterly opposing habitat to the sunbaked plants of the previous day demonstrates the enormous adaptability that *S. hartmannii* possesses.

The next morning we casually motored through the vast greenery of the N.S.W. border country. Our aim was to merely take in the sights and later in the day commence our homeward journey. A small but obvious intrusion of sunlight into an otherwise dense canopy caught our eye. Here we found a well-cultivated plot of marijuana, complete with fencing, plastic tubing and a 50 litre plastic drum. I did a bit of weeding for the non-resident lease-holders (no thank you's required) and moved on a few metres up the road.

There beside the road and still partly on it, were the shattered remains of a huge tree that had succumbed to wind and rain. From the scars on the dirt road and the sunken canopy of the adjoining rainforest, this beast of a tree had wreaked considerable havoc in its final lunge for life.

Along came the local work crew equipped with axe and chainsaw to clear the way. What a job they must have had. Having sawn up the major limbs and the trunk into manageable sizes, each piece was pushed off the road's edge. It took at least a 100 metres of the roadside to disperse the rubble. Long before we came along someone had removed all the epiphytic flora from the wastage. But they were not quite thorough enough.

In the springy, finger-thick maze of what was formerly the upper-most canopy of this dismembered giant, we found a few very small orchid plants. At first we assumed them to be seedlings of *Bulbophyllum bracteatum*, it being an infrequent denizen of this region. But when I found specimens with fat seed pods on short, hair-like racemes, I realised we had stumbled onto something much more important — *B. argyropus*.

This practically unknown species has rarely been observed in Australia and was not positively identified until it turned up in a logged state forest near Dorrigo in 1978 (see Clemesha, *The Orchadian*, Vol. 6, No. 6, Dec., 1979), where it was incorrectly, but understandably, identified as *B. tuberculatum*. *B. argyropus* is now known from Lord Howe Island (where the species was originally described), Norfolk Island and in Australia where it has now been recorded from Dorrigo and the McPherson Range.

Dr Ben Wallace is currently investigating the possible existence of *B. argyropus* in New Caledonia. *B. tuberculatum* is confined to New Zealand only, where it is quite rare. It is often said that plants of these two species are similar but I cannot agree with this. I have plants of each species and they really are quite vegetatively distinct. Confusion arises because so few people have sufficient hands-on experience with both of them.

Once the old blood pressure dropped and our composure was regained, we set about searching every branch and twig, most of which was tangled up with masses of stinging nettles and thorny vines of every kind. It was a very difficult search indeed but after about an hour we had collected about 40 pieces of *B. argyropus*, the largest being about 4cm across. Once again, we had no hesitation in collecting every specimen of this rare species, which was doomed if we left it there. After all, a previous searcher had failed to identify the *B. argyropus*. And the authorities clearing the way quite obviously had no orchid knowledge.

The immediate vicinity was well stocked with this tree species and I would think that *B. argyropus* would be present in them as well. I had the foresight to take some specimens of the leaves back to Sydney. I took them to Sydney Group treasurer and full time professional forester, Doug Binns, who identified the species as *Diospyros pentamera*, or Native Ebony. Now why didn't I know that? It is in the family *Ebenaceae* but is not commercially logged in Australia.

What a majestic tree, situated on the highest ridges of the McPhersons, with copious beards of moss swaying from their wildly tangled crowns, catching every little breeze from all directions. And no moisture-laden fog or cloud could cross this way without surrendering some of their plentiful humidity to this precious little species.

Later on that day and on another mountain many miles away, we were once again on the lookout for things orchidaceous. Never did we imagine that the unusual finds of the previous day could possibly be repeated — but they were.

Late in the afternoon we pulled into a forestry rest area, the main idea being to find a suitable campsite for the night. It just so happened that in the scrub beyond this comfort stop was the beginnings of a dry gully with a few muddy pools of water here and there. Not very promising but we were on a lucky streak that day. So we took off for a bit of a stickybeak.

Neither of us had been at this spot before. The surrounding bush was dry and brittle. We really expected to find nothing — it just didn't feel right. The stagnant water gave way to smooth bedrock where little waterfalls would make a lively scene in times of wet. This made the walking easy but still not a single orchid of any kind did we see.

Finally, in some small spiky shrubs at the edge of the creek, we spied orchid roots in the extreme tips of the branches. There were no leaves, just healthy little roots. We next noticed that there were seed pods just starting to form from minute flowers just closing. With a very audible mixture of yahooing and clapping we realised that we had stumbled onto quite an extensive colony, hundreds of plants in fact, of the comparatively rare *Taenio-phyllum muelleri,* the Leafless Orchid.

This is one of those orchids that is quite likely far more common than previously thought. *T. muelleri* looks for all the world like a seedling *Sarcanthinae* orchid that has rotted at the crown and left only a short root clinging to the twig. Only very close investigation would reveal the minute nick that represents the growing crown in the middle of the root. This is where the short raceme generates from. They can carry from one to three creamy flowers of about 2–4mm diameter which do not open widely. The flowers are probably self-pollinating as nearly every bloom present was forming seed pods.

We followed this dirty little water course for a further 200m until the colony of *Taeniophyllum muelleri* suddenly stopped despite the continuation of its host species. This host tree looked like *Leptospermum* to us. I took a piece back home and once again the very helpful Doug Binns identified it, in a flash, as *Phebalium elatius* spp. *beckleri* — common name: Tall Phebalium, of the family *Rutaceae.* Yeah, that's what I thought it was all right . . .

The plants of *Taeniophyllum muelleri* were confined to this species for their survival. But the really amazing thing we noticed was that about 80% of the entire colony had germinated on the numerous dead twigs and branches of the Phebaliums. We had to look hard to locate any orchids on living host material. I can only assume that there must be a fungus that grows on the dead parts of the *Phebalium* that only infrequently colonises the living tissue.

The shadows were getting too long to spend much more time in this smelly, but interesting little backwater. We still had to find a place to bunk down for the night. On the short walk back to the car we decided to keep our eyes groundwards. We didn't want to discover any more startling new finds. To do so would mean spending a night in the bush with no tucker. For this reason I didn't bother to point out to Denis the colony of *Dendrobium bigibbum*, in full bloom, in the trees we were weaving under.

Well, our trip was now at an end . . . and it could only be described as wildly successful. But in some ways there was a tinge of sadness about finally locating the three rarest species after all these years. This is because finding them licenses me to report that I have now seen, growing in the wild condition, every epiphytic species, plus the three named natural hybrids, that are known to occur within N.S.W. this amounts to some 60 taxons. Its left me wondering about what on earth I'm going to do next. Perhaps I'll develop an interest in whipper-snipper orchids. I can think of a good Australian colloquialism to describe my feelings about that though . . . ❦

AUSTRALASIAN ORCHIDS ILLUSTRATED

[**Ed.—A Taxonomic Complication or an Editor's Dilemma** — It was initially the intention, in this issue, to place under "Australasian Orchids Illustrated", the species *Caladenia longicauda* Lindley, but problems arose. Firstly, it was thought the plant drawn was possibly *C. longicauda* subsp. *redacta* (nom. nud., as the name is not yet validly published). The plant belonged to Helen Richards and was originally identified as a form of *C. longicauda*. Secondly, Helene Wild was not able to carry out a line drawing. As the plant is difficult to maintain in cultivation, Helen Richards needed the flowers for pollination purposes and it was therefore not available for dissection. I wrote to Kingsley Dixon in Western Australia seeking a line drawing of the subspecies, he in turn spoke to Andrew Brown who kindly forwarded me a drawing by Catherine Vassila, completed for his forthcoming systematics paper. Thirdly, the plants in the painting were identified as a natural hybrid between *C. longicauda* and *C. uliginosa*. In the meantime Tony Slater had completed the description for *C. longicauda*. Subsequently Andrew Brown forwarded further drawings of *C. longicauda* and *C. uliginosa*. The result is, instead of having the one taxon, we have line drawings of three different taxa and the painting is of a natural hybrid, but the descriptive text is still of *C. longicauda*. An interesting set of taxa].

No. 10: *Caladenia longicauda* Lindley

Common Name:	White Spider Orchid
Subfamily:	Orchidoideae
Tribe:	Diurideae
Subtribe:	Caladeniinae
Genus:	*Caladenia* R. Brown

Distribution: *Caladenia* is stricted to Australia, New Zealand, New Caledonia, Indonesia and Malaysia. *C. longicauda* is found widespread in south-west Western Australia from Kalbarri to Mt Ragged near Israelite Bay.

Notes: The exact number of species within *Caladenia* is uncertain, as recently a number of research groups have described new species and are proposing to describe more. *C. longicauda* has also had a confused taxonomic history, originally recognised by Lindley in 1840, it has since been placed at a range of taxonomic levels. All species of *Caladenia* are terrestrial orchids and are usually found growing in open forests. They have a single basal leaf, which is generally lanceolate and hairy. The flowers can be distinguished as the labellum is hinged to the base of the column by a short claw and the column has two basal glands. The column of *Caladenia* has obvious wings and it is curved and overhangs the labellum, features which are characteristic of the subtribe. The labellum has obvious callii, which can be developed to aid in the sexual attraction of pollinators by imitating insects, or attracting food seeking pollinators by imitating anthers supplying pollen. *Caladenia* is frequently split into two groups, the large flowered or spider orchids and the small flowered or fairy orchids. *C. longicauda* is a tall slender plant up to 75cm tall, with between one to four large "spider" flowers on each flowering stem. The flowers are generally white with red coloration in the callii and fringe of the labellum. This orchid may have the largest flowers of any orchid, as some flowers have dimensions of 22 x 28cm.

Pollination: Warren Stoutamire determined that this orchid is a food-advertising species and attracts numerous nectar and pollen eating bees and flies. He found that the labellum produced a sweet aroma and suggested that the rows of dark callii, which contrast to the white background of the labellum, probably act as a nectar guide. This species will also hybridise with spider caladenias which are pollinated by sexually attracted wasps and these occurrences are probably a result of wasps which respond to both sets of signals.

Conservation status: *C. longicauda* is a widespread species and is not considered to be endangered, although some of the forms are restricted.

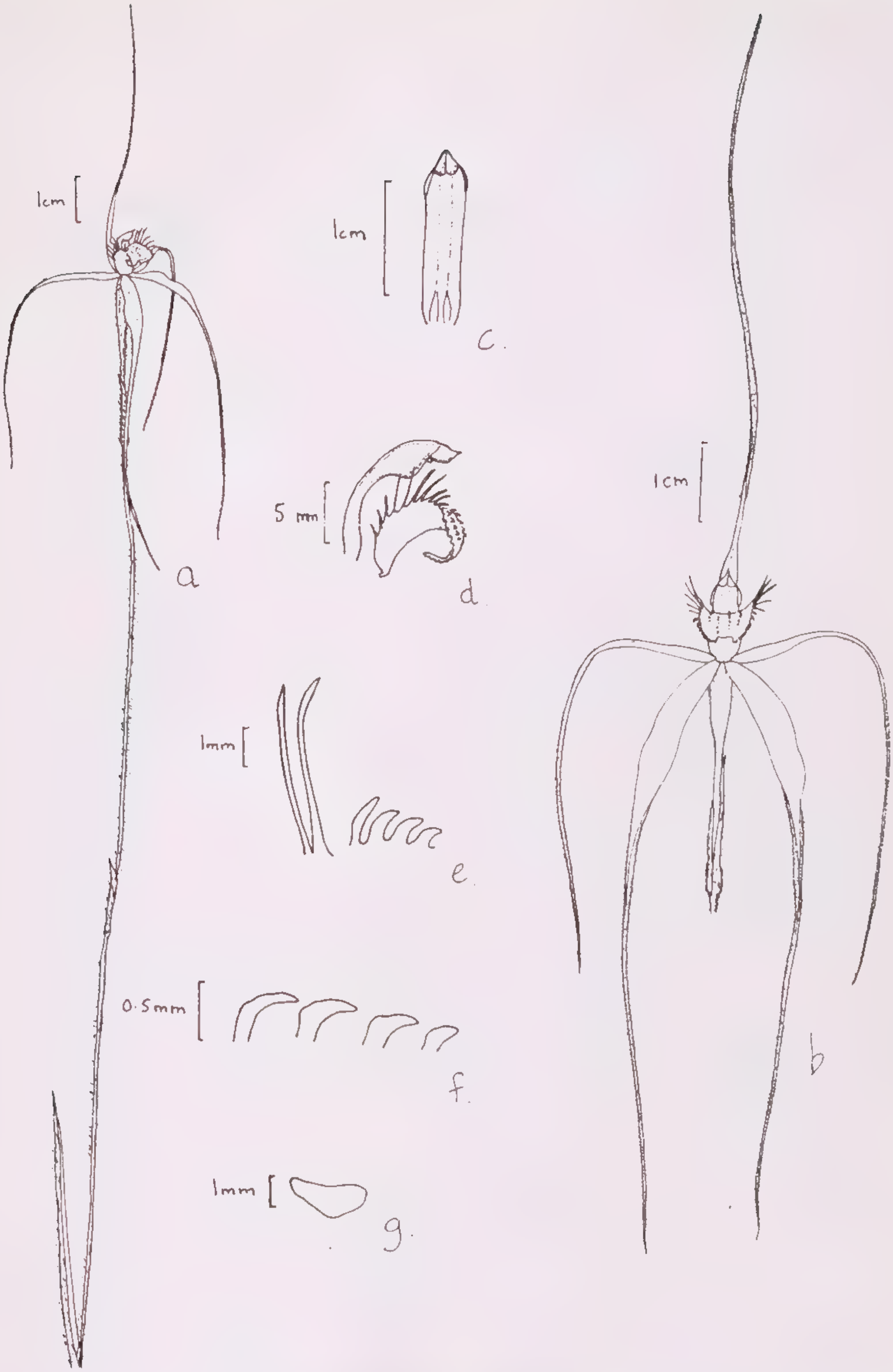
Culture: This orchid, like many other caladenias, is difficult to cultivate and should only be attempted by an experienced terrestrial grower.

Illustration: The watercolour painting is from a plant grown by Helen Richards and is reproduced here by kind permission of the owners, Mr and Mrs B. Richards. Illustrated are a number of flowering plants identified by Andrew Brown to be natural hybrids between *C. longicauda* and *C. uliginosa*. These hybrids are characterised by the red tip to the labellum. This hybrid will be named *C.* X *exserta*, nom. nud., (manuscript name, personal comm. between Andrew Brown and Helen Richards), ". . . there is a photograph of it in Dave Jones book labelled *C. uliginosa*. It gets its red lip from *C. uliginosa* and its elongate creamy tepals from *C. longicauda*."

Description: By Tony Slater, 159a Raleigh Street, Thornbury, Victoria 3071.

Illustration: By Helene Wild, 56 Civic Parade, Seaholme, Victoria 3018.

Line Drawings: *C. longicauda* subsp *redacta* by Catherine Vassila — *C. longicauda* by Andrew Brown — *C. uliginosa* by Andrew Brown.



Caladenia longicauda

(A) Flowering plant from the side. (B) Flower from the front, showing the long slender sepals and lateral petals. (C) Column from the front (stigma not shown). (D) Column and labellum from the side (slightly separated). (E) A comparison of the deep fringe from the lateral lobes and the shallow fringe which is found closer to the tip of the labellum. (F) A side view of the callii from the labellum. (G) A single pollinium.

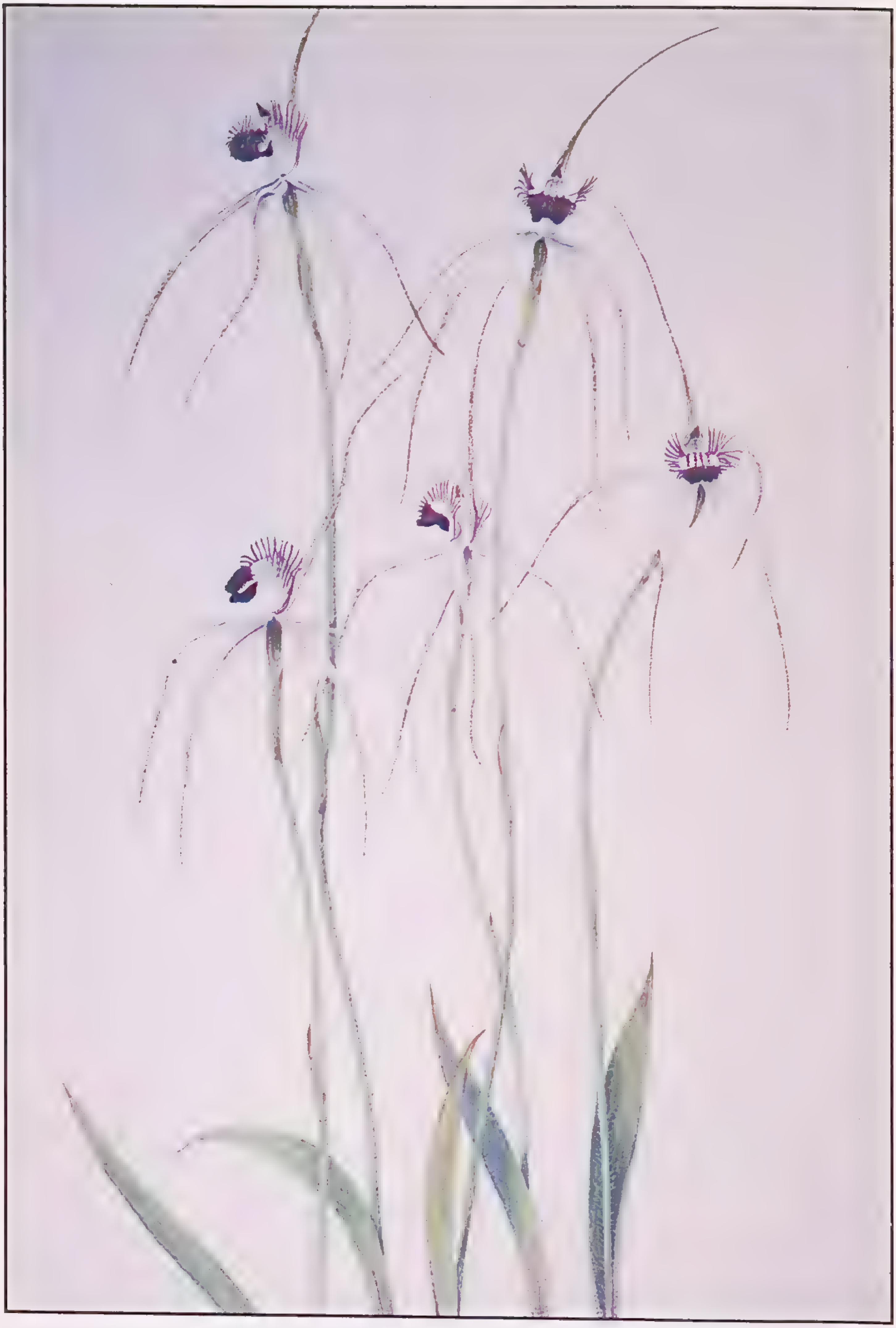
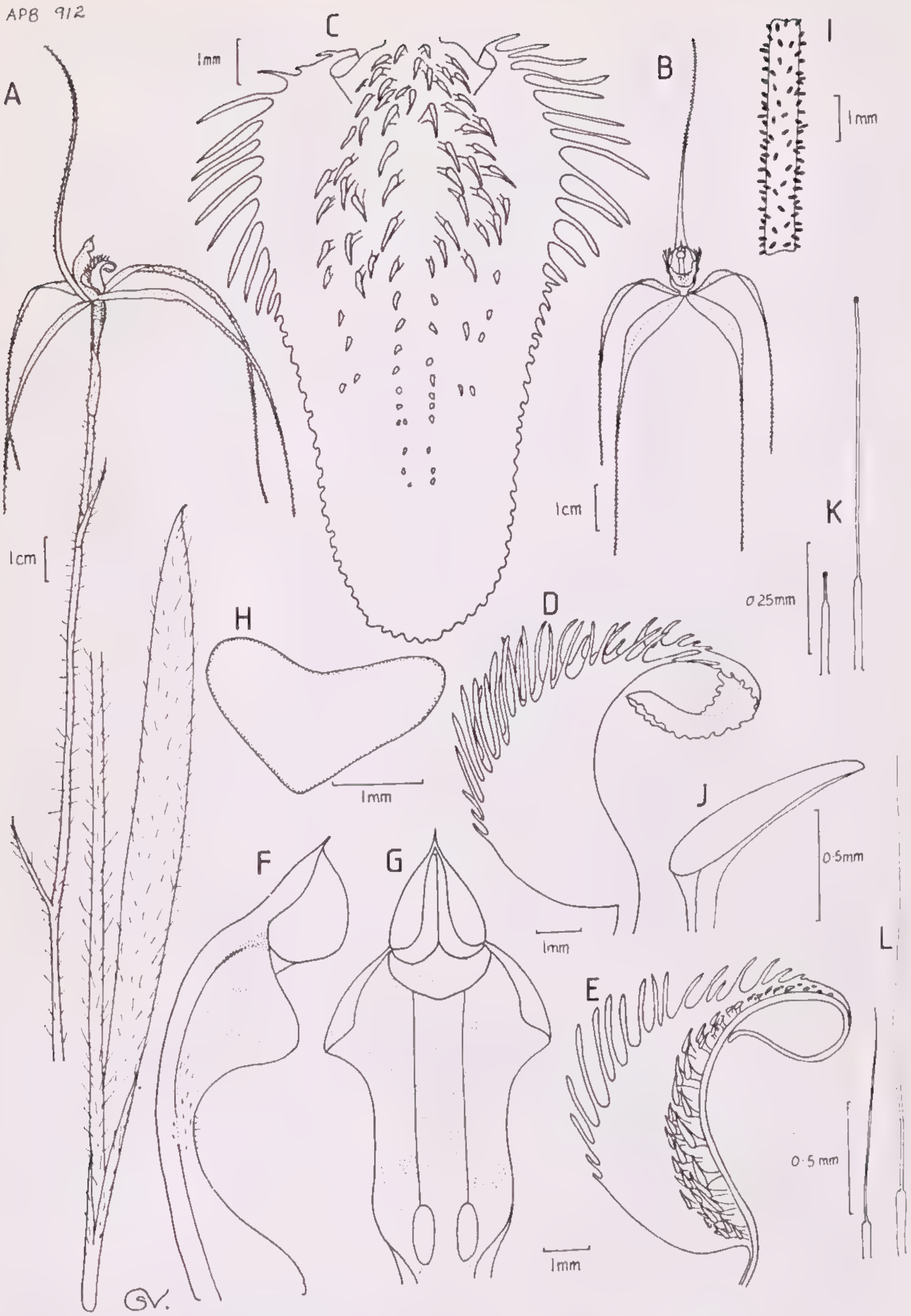
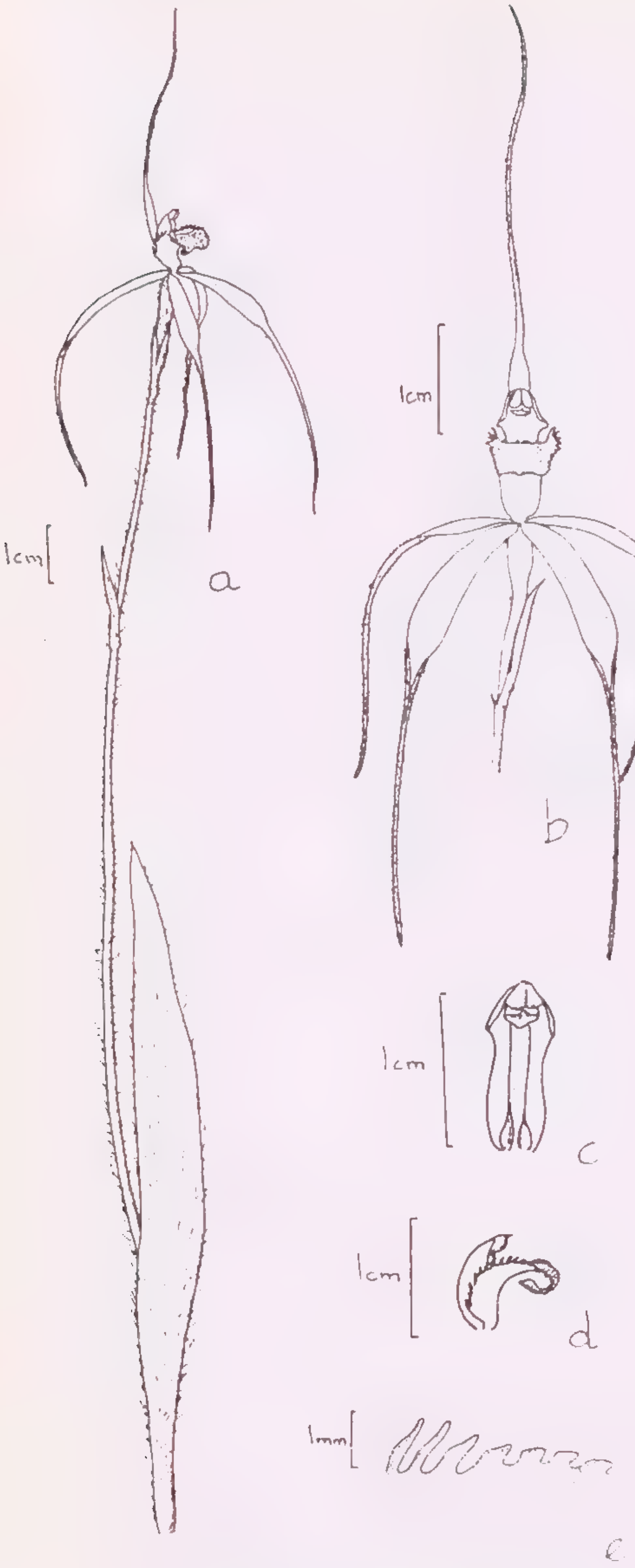


Plate 31: *Caladenia* X *exserta*. From a painting by Helene Wild.



Caladenia longicauda subsp. *redacta*

(A) Whole plant, flower side view. (B) Flower, front view. (C) Labellum, flat. (D) Labellum, side view. (E) Labellum, side section. (F) Column, side view. (G) Column, front view. (H) Pollinia. (I) Glands on sepals and petals. (J) Callii. (K) Ovary hairs. (L) Leaf and stem hairs.



Caladenia uliginosa

(A) Flowering plant from the side. (B) Flower from the front. (C) Column from the front. (D) Column and labellum from the side. (E) A close up of the shortly divided labellum fringe.

BOOK REVIEWS

ORCHIDS OF MALAYA.

By L. B. Segerback.
Published by A. A. Balkema,
P.O. Box 1675, 3000 BR Rotterdam,
Netherlands.
285mm x 205mm, hard cover, 168 pages, 229 black & white & 26 colour photographs. 130 species described.
Price: U.S. $68.50

One might say — Why review a book on Malayan orchids in a purely Australasian native orchid journal? The answer is quite simple — it presents a wider view of our kind of orchid. Of the 50 genera described, at least 33 are represented in our area and many of the balance are closely related. Twelve of the species described are also found in Australasia.

Orchids of Malaya is not a complete flora but is a good representative sampling of the orchids found in the southern part of the Malay Peninsula, including Singapore, Sabah and Sarawak.

The introduction clearly describes the area, its climate, temperatures, ecology, the various regions where orchids grow, until one feels one has arrived and is ready to go search for orchids.

Following this is an easy to follow "Key to the genera", very extensive; making genera identification a simple matter.

Next comes the "Descriptive part"; the meat of the book. From sub-family down to species the descriptions are easy to understand and follow a constant formula from habitat details through plant and flower form to distribution. Briefly the plant form covers rhizome, pseudobulbs and leaves; the inflorescence details shape, habit, bracts, pedicel and ovary. The flowers are described by sepals, petals, lip column, anther and gives the colour of each part. The sizes of all parts are given, in most cases both length and width. Although, with such detailed descriptions, it is not possible to avoid botantical terminology; a seven page comprehensive glossary is included, with special reference to orchids.

The photographs are very professional and sharp and are a great help to identify the species. Many were taken in the field. Each photograph has a size scale and those taken in the field have the altitude and month of flowering shown also.

The author is well known from his earlier work *Orchids of Nigeria* also published by A. A. Balkema.

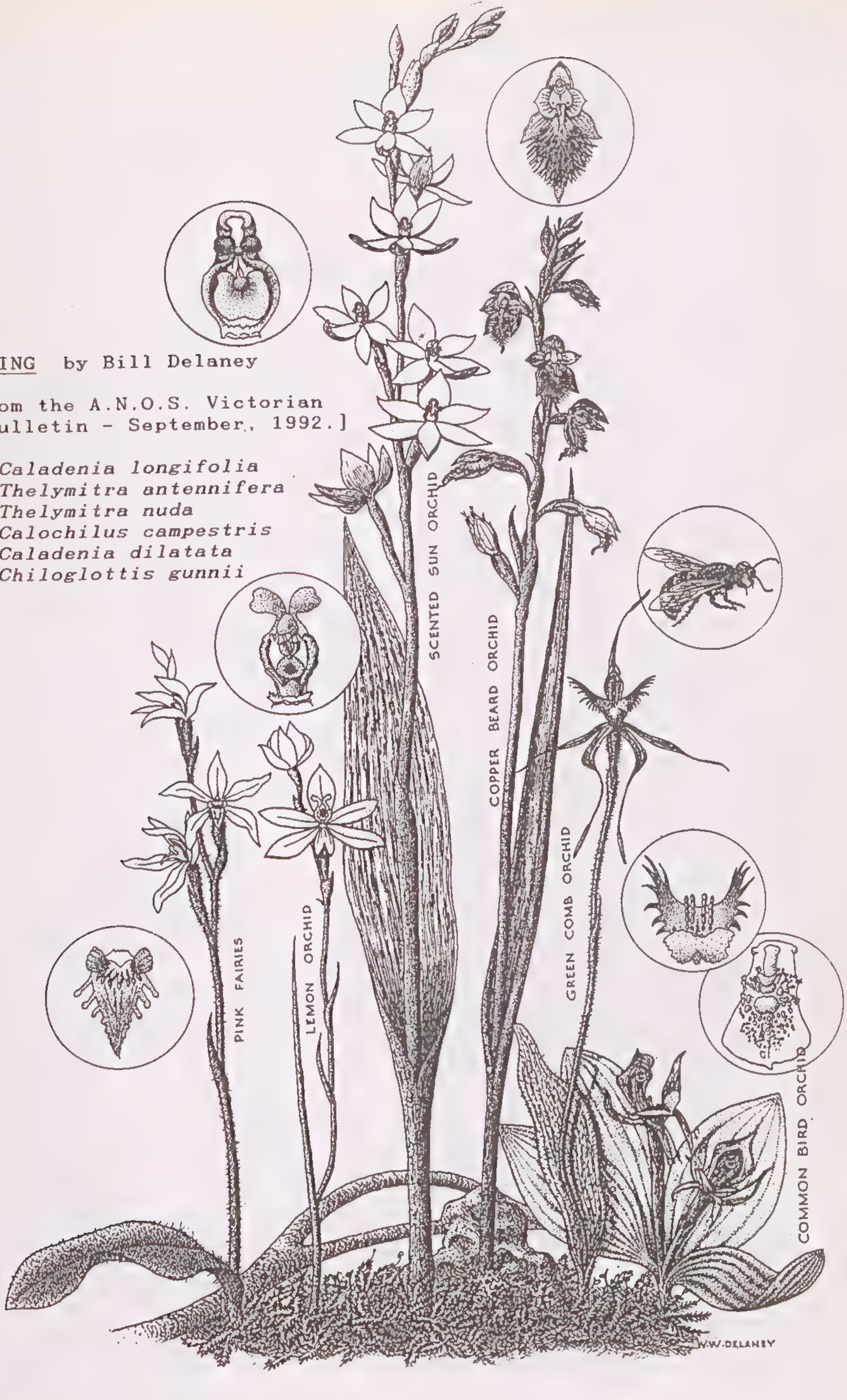
Orchids of Malaya is available from Florilegium, 30 Cameron Street, Balmain, N.S.W. 2041 or from the Publishers.

Walter T. Upton

MID SPRING by Bill Delaney

[Ed. From the A.N.O.S. Victorian Group Bulletin - September, 1992.]

L - R *Caladenia longifolia*
Thelymitra antennifera
Thelymitra nuda
Calochilus campestris
Caladenia dilatata
Chiloglottis gunnii



LETTERS TO THE EDITOR

The Editor, 4th June, 1993

I write in response to your "Talking Point" in that winter *Orchadian*, where you speak of a rumbling animosity between certain factions of our orchid growing community and calling (rightly) for this to end. I would add my voice to that call, but would point out that it is not entirely fair or true to lay the blame at the feet of "the rest (who) talk against them", "them" being the professional botanists. Among some of our professional botanists there are some who seem to resent the fact that the some at least of the so-called amateurs dare to question the validity of their findings and determinations, especially when it comes to orchid nomenclature. Indeed it has been said at times that the only individuals who can determine whether or not a particular botanist's determinations are valid is another professional botanist. This is fantasy, for whether we like to admit it or not, there will always be "amateurs" whose knowledge of a particular subject be it an orchid species or some other subject, equals and often exceeds that of the highly trained and equipped professionals, even though the said amateur has no or little formal training. Indeed some amateurs have the advantage in that they can spend their whole lives working with and studying a particular species or group of species where the professionals may be based hundreds of miles away, forced to rely on field trips, herbarium and living specimens and have other duties.

Yes, these divisions must cease, but it will have to be a two way movement. On one hand the "amateurs" need to be tolerant with and open to the suggestions and determinations of the professionals. The "professionals" accepting that some, perhaps many, of the so-called amateurs are qualified to critique their work or at least some aspects of it and not just those fortunate enough to have some formal qualifications and to have gained employment in that field.

Yes, time will place today's research into its correct perspective, but that does not mean that any are required to sit back and accept all findings as unassailable and unquestionable except by the so-called experts. No one (except God) has a monopoly on the truth, so let each of us remember that and act accordingly by participating in scholarly debate without animosity from either side and let's get on finding out all there is to know about the orchids that we know and love, that hopefully they will be there for future generations to enjoy.

Rev. Peter R. Dunstan,
B.Sc.(Botany), Dip.Hort.Sc.B.D.
9 Main Street, Clunes, N.S.W. 2480

The Editor,

In the lastest issue of *The Orchadian* an article "A New Species of *Sarcochilus*", distribution and habitat is given between the Clarence River and Manning River. Could I draw attention to *The Orchadian* Vol. 1, page 21, "The Orchids of the Gloucester District" by D. Stewart and K. E. E. Ellis. In this article they list *Sarcochilus hartmannii* as being found in the Gloucester District.

Also in the latest issue there is mention of an inaugural meeting of the A.N.O.S. Mid North Coast Group. Would this be more of a resurrection, as an A.N.O.S. Hastings Valley Group was formed on the 28th April, 1978.

Norman Hilliger

AROUND THE GROUPS

— VALE —

On Friday, 28th May members of the orchid fraternity gathered at the Uniting Church at Charlestown, N.S.W. to pay their respects to Ray Hill as his long battle with illness ended.

Ray was one of those unusual growers and hybridisers who believed in sharing his knowledge and encouraged many an orchid lover to improve their hobby.

The door was always open and he liked nothing better than to wander down the backyard and talk Australian native orchids among the beautiful blooms.

To some Ray, will be remembered for winning the Australian Orchid Council Award of Distinction for 1991, with his *Dendrobium* Aussie Child 'Avril' HCC-AD/AOC-NSW, but for those who had the opportunity to know this gentle, sincere man, we truly have lost a friend and our thoughts go to Avril and family.

Pat Burns, A.N.O.S. Central Coast Group

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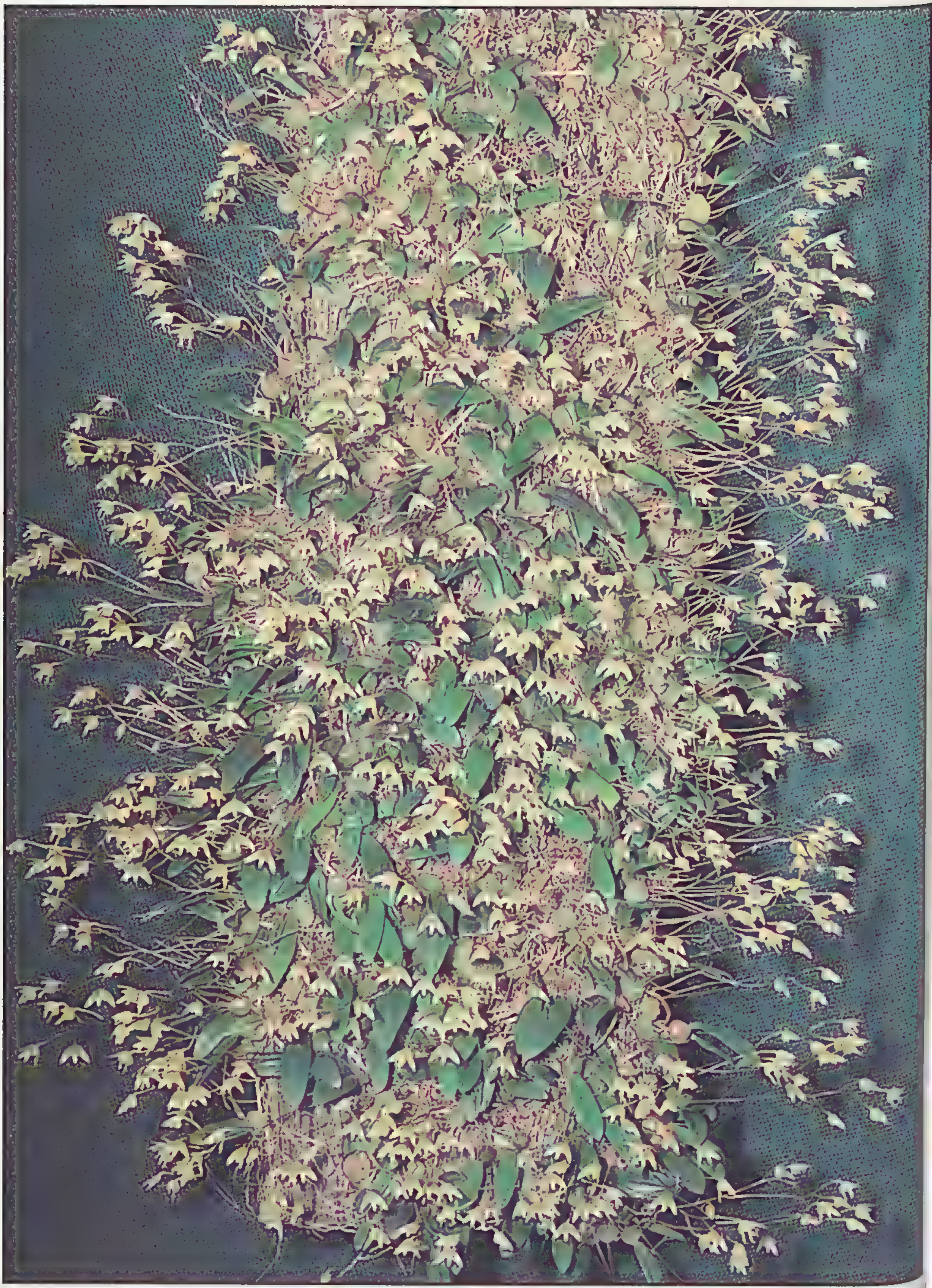

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The Orchadian

Volume 11, Number 2 December, 1993

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Louise Saunders 26/9/91

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TALKING POINT

Whilst shopping in a large chain store the other day, it distressed me to see a large number of *Dendrobium kingianum* mounted on pieces of timber, apparently without any thought for their future, but purely to make money. They had the appearance of being recently collected. I doubt if more than 10% will still be alive next spring. The price tag was $12. A few were in flower, just one or two very small and poor blooms. We must do our best to stop this destruction of our native plants. I am sure, those of us, who know how to grow these plants would not bother to buy them; they are not good forms. We would buy the superior line bred forms from our known native orchid hybridisers. The people who buy them do not realise what they are, quite frankly it is wasting their money and assisting in the rape of our bushlands. If nobody bought them, eventually this kind of destruction would cease. We must, therefore, publicise these facts and do our best to ensure that the public are aware of the problems, at the same time, telling them not to buy them. All our large stores are doing this, not just the one I was in, it is happening far too frequently. Letters have been written to these stores, but they claim they are not trading illegally, so we must try another approach, STOP THE PUBLIC BUYING THEM.

On a happier note – The Second Australasian Native Orchid Conference was a resounding success. It is really great to meet old friends and make new ones. Looking at the list of Registrants I notice they came from U.S.A., New Zealand, New Guinea, as well as from W.A., S.A., Vic., N.S.W., A.C.T. and Queensland. The warm feeling emanating from a conference of this kind is solely due to our native orchids. We grow them, admire them, conserve them, draw them, exhibit them, judge them research them, write and converse about them; in return they give of themselves to us making our lives much fuller and of greater quality, so much in return for so little.

Walter T. Upton

Seasons Greetings

and

Best Wishes

for the New Year

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WATERING AND FERTILISING OF ORCHIDS

Noel J. Grundon
4 Jean Street, Toowoomba, Queensland 4350

Abstract: To grow and flower, orchids must receive the basic necessities of life: light, water, air and mineral nutrients. Maximum growth and flowering will occur only when all these factors are supplied at their optimum rates. There is usually good agreement between growers about the amount of light and air needed for best growth and flowering, but disagreement often exists between growers over the correct amount and methods of supplying water and the fertilisers that contain the nutrients orchids need.

INTRODUCTION

The supply of water and fertilisers is linked; it has been said that water is the vehicle of good fertilising practice. Although little research has been undertaken on the specific fertiliser needs of orchids, we can assume that becase orchids are plants, they will behave like all other plants. Therefore, we can make the following assumptions:–

1. Orchids require the same nutrient elements for healthy growth that other plants need.
2. Orchids can absorb these nutrient elements only when the nutrients are dissolved in water.
3. The roots of most orchids cannot function when they are starved of oxygen in a water-logged compost.

The aim of watering an orchid is to provide the water needed for growth and to provide the vehicle for dissolving the nutrient elements the plants uses in its cycle of life. The aim of fertilising an orchid is to provide all the nutrient elements needed for the orchid's life cycle, in a form that the orchid can absorb and in the amounts needed for healthy growth. Providing sufficient water and nutrient elements for healthy growth and flowering is the art of good culture.

WATERING

Frequency: How often you water will be determined by many factors including the size of the pot, the size of the plant, the closeness or fineness of the compost and the prevailing weather conditions. Most epiphytic orchids, such as our native dendrobiums, are drought adapted plants and can tolerate extended periods without water. However, the more terrestrial genera are not as well adapted to withstanding extended dry periods during their period of active growth. Hence, the compost can be allowed to become dry before most epiphytic genera need to be watered, but the more terrestrial genera need watering just before the compost becomes dry.

If the compost is close or fine (i.e. with ample peat moss), you will have to water less frequently than if you are using a coarse compost (i.e. with large bark, charcoal or gravel). If the plants are large for the size of the pot, they will use up the water more quickly than will a smaller plant in the same sized pot and may need to be watered more frequently. If the temperature is hot, or if there are drying winds, watering will need to be done more frequently.

How Much: Each watering should provide sufficent water to wet all the compost in the pot. That is, watering should continue until water runs freely from the drainage holes of the pot. If you are watering by hand, it is easy to provide just the correct amount of water to each individual pot, but remember that the compost will absorb some of the water and it is a good idea to go back and rewater the pots after about 15–30 minutes to make sure all the compost is wet. If you have a timing device to water your plants, ensure that the water is not turned off until water is dripping freely from the drainage holes of the pots.

By supplying excess water at each watering, you make sure that the compost is completely moist and contains sufficient water to last the plant until the next watering. By providing enough water to cause it to drip freely from the drainage holes of the pot, you ensure that unused fertiliser is leached from the compost and does not accumulate in the compost to cause root or leaf burn.

Water-logging: The compost is where the roots live. To live and function correctly, roots need a source of energy and a supply of oxygen. The energy comes from the process of respiration where sugars such as sucrose are converted into carbon dioxide and water. The sugars are transported down from the shoot. However, oxygen is needed to convert the sugars into carbon dioxide and water. This oxygen is absorbed directly by the root from the air in the compost.

A good compost is composed of a solid phase, a solution phase and a gaseous phase. The components of the mixture (i.e. the bark, charcoal, gravel, peat moss) are the solid phase. The solution phase is the water and dissolved fertiliser nutrients. The gaseous phase is the air from which the roots will absorb oxygen. Before watering, the compost will consist mainly of just the solid phase and the gaseous phase. During watering, water enters the pores between the solid phase components. After watering, water drains from the larger pores, allowing air to enter the compost. Within a short time after watering (e.g. 1 hour), all three phases will exist within a good compost.

However, if the compost is too fine, there may be no pores large enough to drain free of water and allow entry of air. The roots in such a compost will be starved for oxygen and will be unable to function fully. Such a compost is said to be water-logged. If you suspect that your compost is not draining enough to allow entry of air, open it up by using less peat moss or fine sand and adding more coarse bark or small gravel. Remember, it is easier to water more frequently with a slightly coarser compost than to try to remove water from a water-logged compost.

Over-watering: It is often said that more plants are killed from over-watering than from under-watering. However, the real killer is water-logging and the real problem is not over-watering but too fine a compost. You cannot over-water a compost which has been correctly designed with a graded size of components that allows water to drain from the larger pores and providing for the entry of air within an hour of watering. Your compost must be sufficiently coarse that it will drain and allow entry of air, even when it rains all day. “Over-watering” is a symptom of a poorly designed compost. Change the compost! Do not blame the water!!

Water Quality: Most orchid growers do not need to worry about water quality. By water quality, I refer to the amount of dissolved salts, especially sodium chloride, that are in the water. Most town or city water supplies contain low or acceptable levels of dissolved salts. However, some growers, especailly those using bore water may need to check the quality of their water if they are experiencing difficulty in growing their orchids. From my own experience, I know that water containing more than about 100 parts per million (ppm or micrograms per litre) sodium can kill many native orchids. Especially sensitive are the terrestrial genera, the epiphytic dendrobiums from inland north Queensland (e.g. *Dendrobium semifuscum, D. fleckeri, D. adae, D. agrostophyllum*), all bulbophyllums and epiphytic members of the Sarcanthinae. the lithophytic species, such as *D. kingianum, D. speciosum, Sarcochilus ceciliae, S. hartmannii* and *S. roseus* and the epiphytic species from coastal habitats, such as *D. discolor,* appear to be more tolerant of sodium levels in the water.

FERTILISERS

Every fertiliser programme should aim to provide the essential nutrients in adequate amounts and in a form that plants can absorb. Furthermore, these nutrients must be provided at the time needed by the plants.

Essential Nutrients: Sixteen elements are considered essential for the growth of all plants, including orchids. These elements are divided into a macro-nutrient (or major nutrient) group and a micro-nutrient (or trace element or minor nutrient) group. However, this division is only for the convenience of man and is based on the amount of nutrient needed for healthy growth; the plant knows nothing about this division and makes no distinction between macro- and micro-nutrients in terms of their importance for healthy growth.

The macro-nutrients are: nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg) and sulphur (S). The micro-nutrients are: Iron (Fe), zinc (Zn) copper (Cu), manganese (Mn), boron (B), molybdenum (Mo) and chlorine (Cl). The non-mineral essential elements are: carbon (C), hydrogen (H) and oxygen (O).

About 96% of all plant material is made from carbon, hydrogen and oxygen (Table 1). the carbon and oxygen comes from the carbon dioxide in the air, while the hydrogen is obtained from water absorbed by the roots. Again you will notice the importance of an adequate supply of water to ensure that the plant receives enough hydrogen.

How Much: The values in Table 1 are approximate concentrations in the "average" plant. Concentrations of each nutrient will differ between species of orchids and also between different organs on the same plant. Thus, young shoots contain higher concentrations of nitrogen, potassium and phosphorus, while older shoots often contain higher concentrations of calcium. The data in Table 1 are best used as a guide to the ratios in which the nutrients need to be supplied to a plant. That is, we need to supply about 1.5 times more nitrogen than potassium, about 2 times more potassium than calcium, than magnesium and sulphur and about 140,000 times more nitrogen than molybdenum.

The amount of growth possible is governed by the amount of nutrient supplied. If all elements are supplied in adequate amounts, there will be no nutrients limitations on growth. However, if only one element is supplied in less than the required amount, that is in deficiency amounts, growth will be less than optimum. In addition, growth can be reduced if too much nutrient is supplied and it becomes toxic to the plant. For most elements, there is a wide range between deficiency and toxicity, but be careful with boron, manganese, copper and zinc. With these nutrients, the range between deficiency and toxicity is narrow.

Source of Nutrient Elements: Plants can only absorb nutrients which are dissolved in water. When common table salt, sodium chloride, represented as NaCl, dissolves in water, sodium ions (Na^+) and chloride ions (Cl^-) are formed. Plants absorb these and other soluble ions from the water, either through their roots, or through the leaves when the fertiliser solution is sprayed onto the plant. Therefore, the compost must be moist to dissolve the solid fertiliser and form the soluble ions that will be absorbed through the roots.

A fertiliser must be soluble if it is to be of any value to the plant. If the fertiliser is in an organic form, such as Fish Emulsion® or fowl manure, it must be converted by bacteria or fungi into soluble inorganic ions which can dissolve in water before the plants can absorb the fertiliser nutrients.

The orchid can obtain its nutrients from a number of sources. In nature, decomposing compost or bark and plant material and dissolved bird and animal droppings provide all the nutrient elements. In captivity, the decomposing compost provides some nutrients. The water used to water the plants will contain some nutrient elements. In fact, most waters contain sufficient micro-nutrients for healthy growth of most plants. However, fertilisers are the most common source of nutrient elements for orchids growing in captivity. The fertilisers can be inorganic and easily soluble (such as Aquasol®, Garden Gold®, Flowfeed®), inorganic and slowly soluble (e.g. Superphosphate®), or organic and only partly soluble (e.g. Dynamic Lifter®, Fish Emulsion®). Slow release fertilisers (e.g. Osmocote®, Nutracote® are also available and are usually composed of an inner source of easily soluble fertilisers wrapped in a porous coating of resin. Water and dissolved fertilisers can pass through the resin coat. So each time you water, some of the water enters through the resin coat and dissolves some of the fertiliser. The dissolved fertiliser then leaks out and provides nutrients for the plant.

Most of the easily soluble, inorganic fertilisers, often sold as a "complete" fertiliser, have little or no calcium, magnesium and sulphur. Hence, it is often necessary to adjust the formulation of these fertilisers to add all the nutrients needed by orchids. Bill Johnson has designed such an adjustment for Aquasol® and many people have achieved good growth using Johnson's Formula.

The ratio of the elements in the fertiliser are printed on the packet. Many people prefer to use a high nitrogen-high potassium-low phosphorus ratio during vegetative growth, changing to a low nitrogen-high potassium-high phosphorus ratio during the flowering and resting stages of growth. There are a number of commercial fertilisers which have different ratios of the elements; Campbell's Yellow® and Campbell's Blue®, Flowfeed EX7®, Flowfeed GF9® and Flowfeed HP8® are readily available. If you have access to scales which weigh small quantities, you could try using the formulations shown in Table 2 which are based on readily available commercial fertilisers. This formulation provides 200 ppm nitrogen, 22 ppm phosphorus, 115 ppm potassium, 85 ppm calcium, 24 ppm magnesium, 33 ppm sulphur and 4.2 ppm iron. If you wish to lower the nitrogen concentration to 100 ppm, just leave out the urea.

How Often: For most orchids, better growth is obtained by supplying a weak solution of fertiliser every watering or every week, rather than a strong solution every month or so.

CONCLUSIONS

Successful growth and flowering of orchids depends on supplying the correct amount of water and fertiliser nutrients, among other things. Water supplies hydrogen to the plant and is the vehicle whereby the fertiliser nutrients can enter through the roots or leaves of the orchid. The nutrients are most effective when supplied during the active growth phase of the plant. The most efficient forms of fertiliser are the soluble forms, although slow release types and organic forms are also quite effective if supplied according to the manufacturers' directions. The amounts needed will depend upon the size of the plant, the amount of decomposition occurring in the compost and the purity of the water supply. There is no one fertiliser recommendation that is optimum for all species and growing conditions and enthusiasts are encouraged to develop their own programme to suit the genera they grow and their growing conditions. ✾

TABLE 1. Approximate concentrations of nutrient elements required for healthy plant growth.

	Concentration in dry matter	
Element	Per Cent (%)	Parts per million (ppm)
Oxygen	48	480,000
Carbon	42	420,000
Hydrogen	6	60,000
Nitrogen	1.4	14,000
Potassium	1.0	10,000
Calcium	0.5	5,000
Magnesium	0.2	2,000
Phosphorus	0.2	2,000
Sulphur	0.1	1,000
Iron	—	100
Chlorine	—	100
Manganese	—	50
Boron	—	20
Zinc	—	20
Copper	—	6
Molybdenum	—	0.1

TABLE 2. Fertilising programme for orchids.

	Grams per 200 litres (44 gallons)	
Fertiliser	Small seedlings	Adult plants
Urea	8	40
Monoammonium phosphate	4	20
Potassium nitrate	12	60
Calcium nitrate	20	100
Magnesium sulphate	10	50
Iron chelate (FeEDTA)	1.2	6

THE PACIFIC GENUS *EARINA*

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Abstract: *Earina* is a Pacific island genus, regarded currently as including two growth forms: those with slender, long, leafy, cane-like stems and those with short, congested, rather fleshy stems, completely obscured by the iris-like bases of the foliage. The former has four species, the latter two.

Key words: *Earina, Orchidaceae,* New Zealand, New Caledonia, Fiji, Samoa, Vanuatu.

INTRODUCTION

The genus *Earina* has been said to contain as many as ten species scattered throughout the Pacific islands. Recent authors have combined several species, some even lumping the quite distinct New Zealand *Earina autumnalis* and *E. mucronata.* This paper examines the contemporary literature and its historical roots.

HISTORY

1769: During the spring Captain James Cook's *Endeavour* naturalists Joseph Banks and Daniel Solander found eight coastal New Zealand orchid species. Solander later wrote in his unpublished manuscript that one of them, *Epidendrum mucronatum,* was "parasitic on trees, Whitianga".[1] Sydney Parkinson sketched it and the complete engraving is among the copper plates Banks later left to the British Museum (Figure 1).

1773: In March Captain Cook's *Resolution* naturalist Johann Reinhold Forster saw at Dusky Sound "a very fine *Epidendrum* in flower, which spread a very agreeable smell".[2] Anders Sparrman later (1786) wrote "Leaves sheathing the stem, lanceolate, densely nerved; peduncles paniculate, terminal, with scale bracts; lip of the nectary erect with rounded apex".[3] Forster's son George labelled his sketch "*Epidendrum Autumnale* . . . N.Z. Dusky Bay March 29th. 1773". There is a partly coloured drawing in the British Museum (Natural History) and an uncoloured print (Figure 2). The specimen was deposited in the Paris Herbarium.

1799: The Swede Olaf Swartz changed the name of Forster's *Epidendrum autumnale* to *Cymbidium autumnale,* no doubt after seeing the Paris specimen.[4]

1832: The Frenchman Achille Richard used the name *Cymbidium autumnale* in his *Essai d'une Flore de la Nouvelle-Zelande.*[5] No doubt he had seen Forster's Dusky Sound specimen in Paris too.

1834: The Englishman John Lindley gave some tips for growing epiphytes, pointing out that not all were suited to hothouse conditions.[6] He mentioned a few temperate-climate species, among them –

> *Earina mucronata*..., although occurring as far to the Northward as 35°. Lat. in humid forests at the Bay of Islands, in New Zealand, exists also in abundance in the "very (permanently) damp woods which clothe the shores of Dusky Bay, (Lat. 45° 45′ S.) on the western side of the Larger or Middle Island of New Zealand," where it was originally observed by Forster, in Cook's second voyage and where it has been since met with by Mr Cunningham, whose words we have quoted.

Lindley made two mistakes: Allan Cunningham had not ventured south of the Bay of Islands, so could not have "met with" an *Earina* or anything else in Dusky Sound; and Forster's Dusky Sound specimen was not *E. mucronata* – it was *E. autumnalis.* Lindley went on to describe formally the genus *Earina* and the species *E. mucronata* (using, but not acknowledging Solander's specific name); he mistakenly included in synonymy Forster's *Epidendrum autumnale* (and thus Swartz's *Cymbidium autumnale*). The French knew

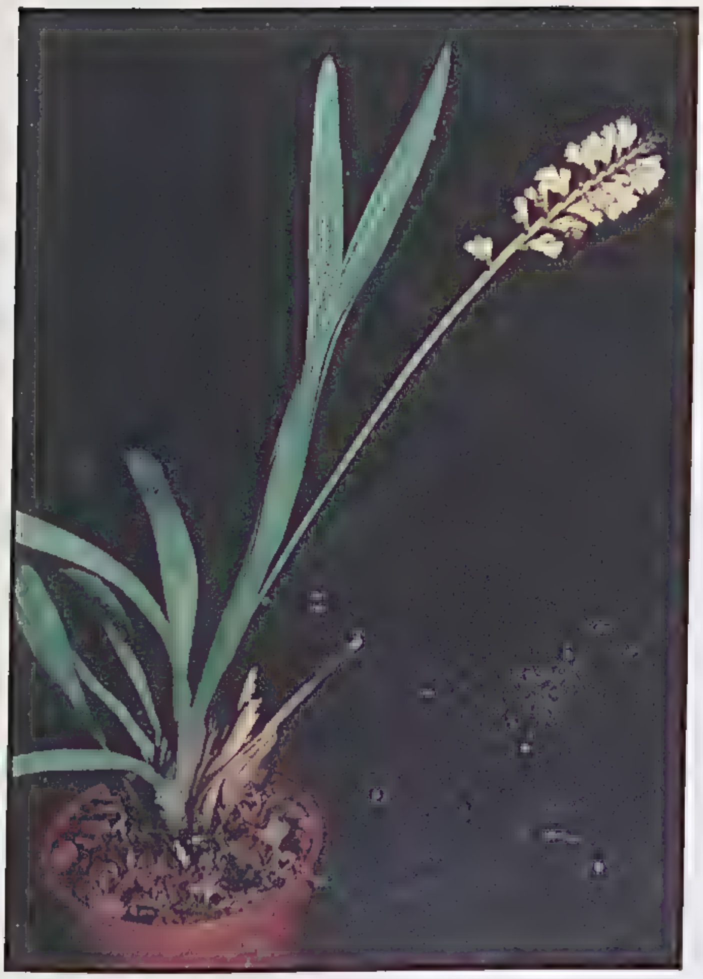


Plate 1: *Earina valida.* Photo: P. Cribb.

Plate 2: *Earina deplanchei.* Photo: P. Cribb.

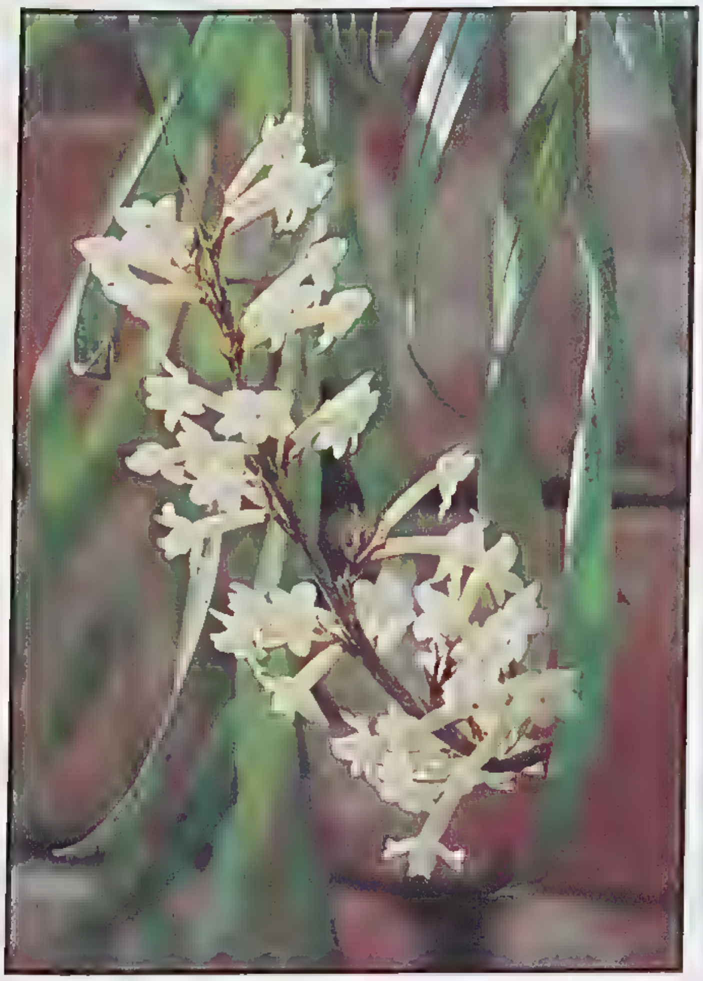


Plate 3: *Earina mucronata.* Photo: Ian St George.

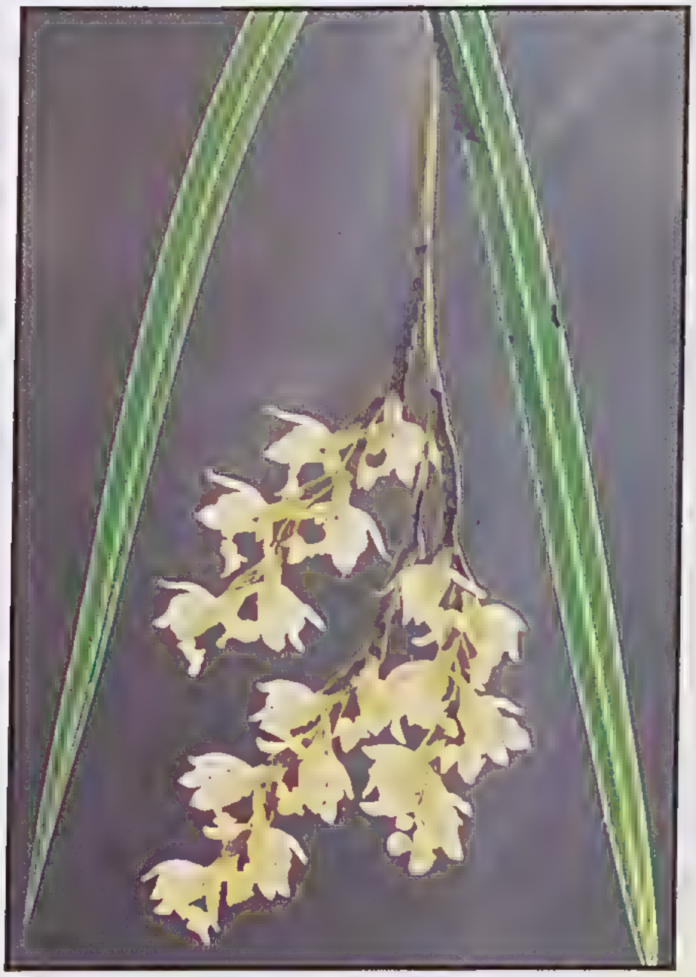


Plate 4: *Earina autumnalis.* Photo: Ian St George.

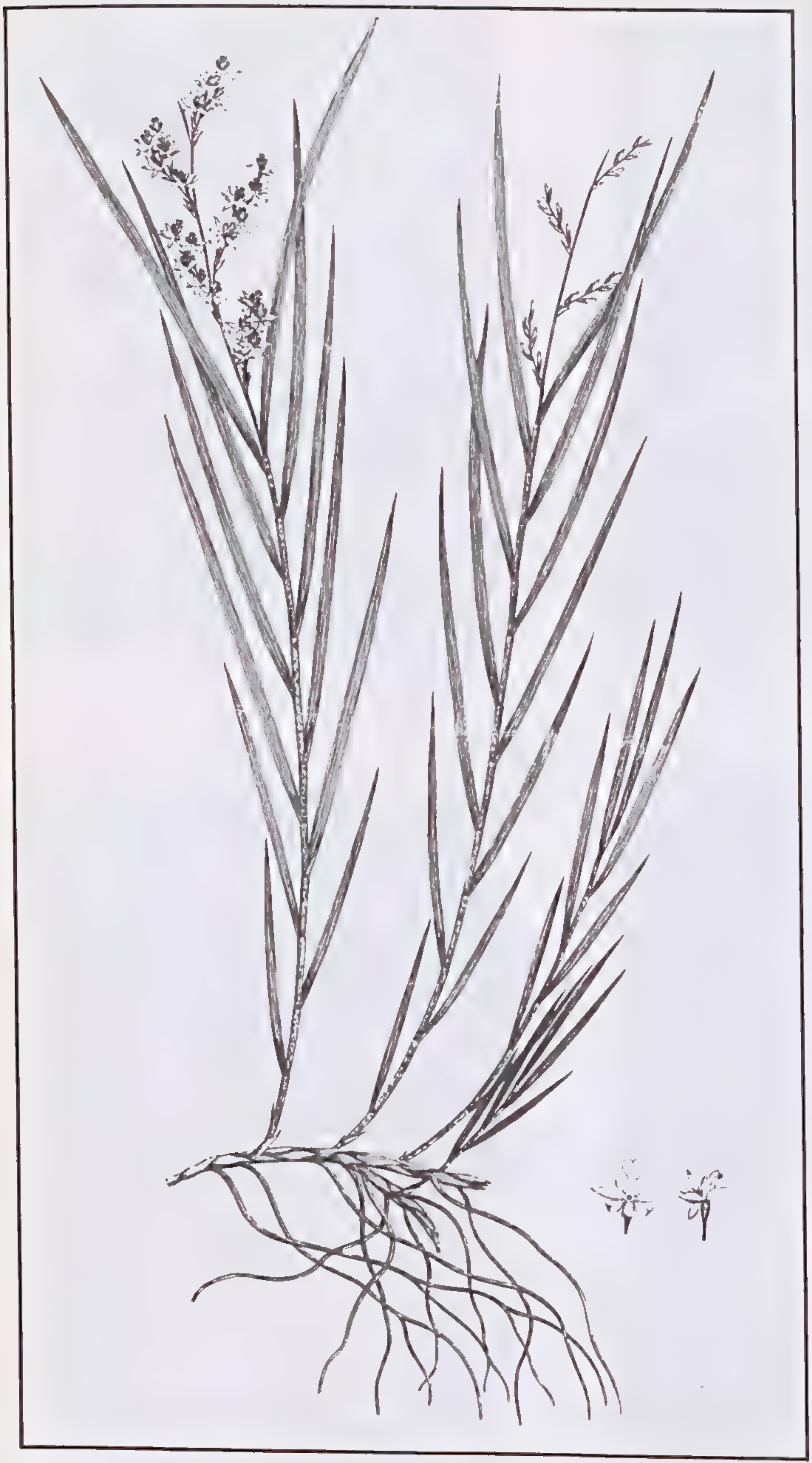


Fig. 1: *Earina mucronata:* monochrome print from a copper engraving by Frederick Polydore Nodder from a drawing by Sydney Parkinson 1769 (41x23cm).

about *E. autumnalis*, but the English did not: 1834 was only 19 years after the Battle of Waterloo and Lindley would not have been welcome in Paris. Politics always takes precedence over science.

1836: Allan Cunningham followed Lindley's example and included only *E. mucronata* in his list of New Zealand plants.[7]

1839: J. C. Bidwill was at Rotorua from Tuesday 13 March to Wednesday 21 March. He wrote,[8] –

> I discovered in the woods here... a most beautiful epiphytal orchideous plant, with a very powerful perfume; if this plant would grow out of doors in England, as I think likely, it would be quite a new feature in gardens.

He wrote a footnote: "Probably *Earina mucronata*", but (as Dan Hatch points out) adding the perfume to the date of flowering, it seems more likely that this was *E. autumnalis* and perhaps the actual specimen eventually described in –

1843: By Lindley as *E. suaveolens* ("fragrant"):[9]

> This extremely rare Orchidaceous plant

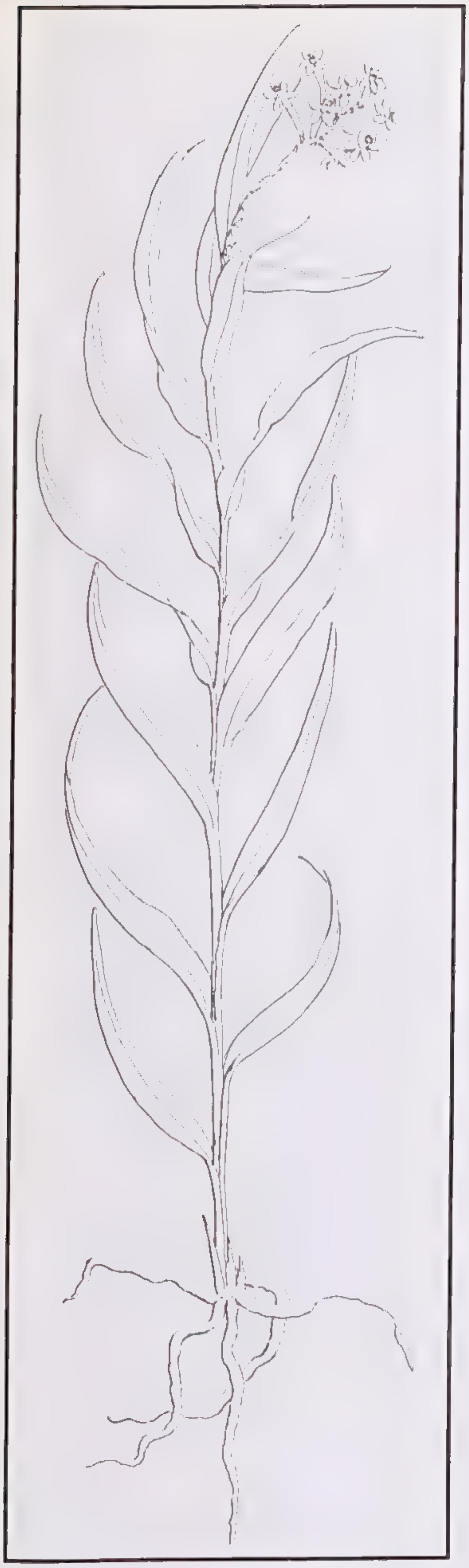


Fig. 2: *Earina autumnalis:* monochrome print from a drawing by George Forster 1773 (37x10cm).

> was sold the other day among a collection of New Zealand varieties, brought to this country by Mr Bidwill... from Mr Bidwill I learn that it grows near Rotorua in New Zealand, on trees not very densely covered with leaves; that it is very rare even there and most deliciously perfumed.

Lindley knew *E. mucronata* and he could see that Bidwill's plant was not it. But he had still not seen the Paris specimen, or he would have known that Bidwill's plant was *E. autumnalis.*

1844: W. J. Hooker wrote on *Earina mucronata* with an accompanying illustration by W. H. Fitch. As Lindley had, Hooker quoted Forster's *Epidendrum autumnale* and Swartz's *Cymbidium autumnale* as synonyms.[10] He had not been to Paris either.

1853: J. D. Hooker separated *E. autumnalis* and *E. mucronata* in his *Flora of NZ.*[11] But he made a further error which may have added to the confusion: after each species he wrote "*Banks et Sol. MSS. et Ic.*" – referring to Solander's unpublished manuscripts and Parkinson's drawings from Cook's first voyage, by then in the Banksian collection in the British Museum. Hooker must have found drawings of both Earinas and attributed both to the first voyage (he did it again for his *Handbook of the NZ Flora* in 1864). As noted above, Solander had written about (and Parkinson had drawn) only *E. mucronata ("Epidendrum mucronatum")*; it was George Forster (of Cook's second voyage) who drew *E. autumnalis*. Many of his drawings were sold to Banks in 1776 – this one remained with the Parkinson sketches, where Michael Hoare missed it when he listed the Forster drawings from the second voyage.[2] The engraver of the Forster drawing (Figure 2) is unknown, but a number of engravings were made for a planned book of plant illustrations; the work is inferior to the copper engravings from Parkinson's drawings.

1895: When monotone prints from some of the copper engravings from the first voyage were sent to the New Zealand Education Department in 1895, copies of this Forster print were included. The copy used by Kirk is now in the National Museum, Wellington (Figure 2) and that used by Cheeseman now in the Auckland Institute and Museum collection.

1919: Thomas Cheeseman described *E. aestivalis*, a third

New Zealand species, occurring from Northland to Wellington. Later writers (Hatch and Moore) included it with *E. mucronata*.

HOW MANY *EARINA* SPECIES ARE THERE?

Lucy Moore (1970) wrote in *Flora of New Zealand* Volume II, "*c.* 10 spp., five in New Caledonia, two in NZ and one each in Tahiti, Samoa and Fiji (possibly two)".[12] That would mean 10 or 11 (or 12 if you add *E. aestivalis*) species in the genus.

New Zealand: Although *E. autumnalis* and *E. mucronata* have long since been recognised as distinct, several writers on Pacific island flora have sustained the old error. Hallé (1977) wrote that Lindley's *E. mucronata* was an illegal name for *E. autumnalis*.[13] Recently Kores (1989)[14] and Smith (1991)[15] have followed suit. The third New Zealand species *E. aestivalis* is controversial, not unanimously accepted as separate from *E. mucronata*. Perhaps three for New Zealand.

New Caledonia: Hallé (1977) included three species (*E. brousmichei* and *Agrostophyllum drakeanum* and *Earina valida*) in *E. valida*, two (*E. crassicaulis* and *E. deplanchei*) in *E. deplanchei* and continued *E. floripecten*.[13] Three for New Caledonia.

Samoa: Christophersen (1935) listed *E. samoensiana*.[16] Kores (1989) wondered if *E. samoensiana* should be included in *E. valida*, but was unable to examine any authentic material,[14] and Lewis and Cribb (1989) did include *E. samoensiana* in synomymy with *E. valida*.[17] Smith (1991) listed *E. valida* in Samoa.[15]

Vanuatu: Lewis and Cribb (1989) listed *E. valida*.[17]

Fiji: Gibbs (1909)[18] listed *E. laxior*. Parham (1972) listed *E. laxior* and *E. plana*.[19] Kores (1989) lumped *E. laxior*, *E. plana* and *E. brousmichei* (after Hallé)[13] into *E. valida*.[14] he also agreed with Hallé that *E. floripecten* differed from *E. valida*. Smith (1991) agreed about the lumping and listed New Caledonia, New Hebrides, Fiji and Samoa for *E. valida*.[15]

Tonga: Yucker (1959) did not include *Earina* among the Tongan flora,[20] though Hallé (1977) included Tonga in the distribution of *E. valida*.

Tahiti: Only the 1838–42 United States Exploratory Expedition (USEE) reported finding an *Earina* from Tahiti and apparently (see Smith)[15] they mixed up some of their specimens. Del Castillo (1893) included *E. laxior* among Tahitian plants, but he referred only to a USEE specimen and wrote, "I have not seen this plant".[21] Hallé doubted that *Earina* occurs as far east as French Polynesia. We can dismiss Tahiti.

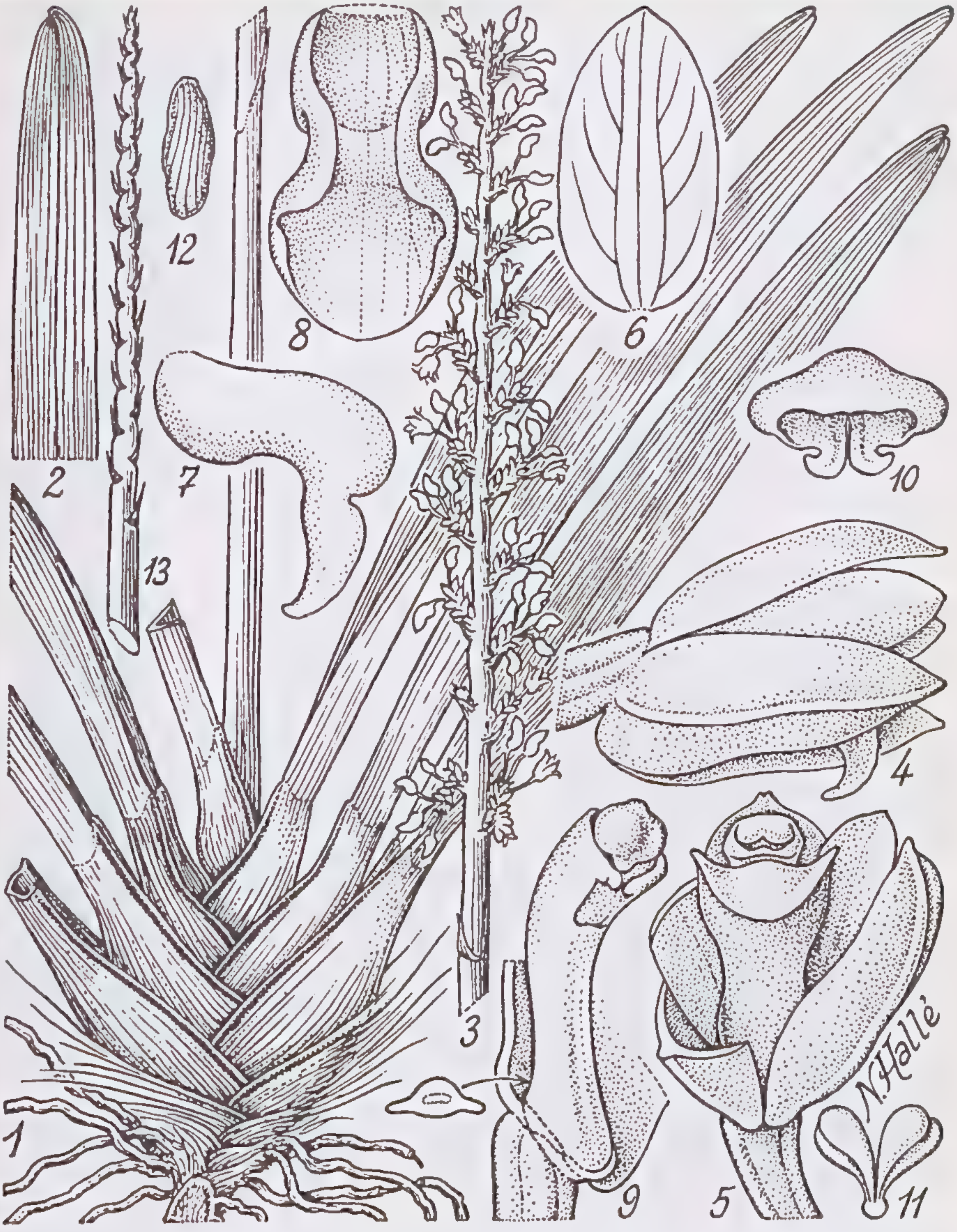
THE SPECIES

Order Liliales, Family Orchidaceae, Subfamily Epidendroideae, Tribe Glomerinae.

*E. valida** is a big epiphyte with overlapping pairs of sheaths, wide towards the base, 5–12cm long. Leaves stiff, ribbonlike, 10–48 x 0.8–2cm. Inflorescence terminal, 30–75cm high, on a very long naked scape, 4–8mm wide. Racemes 5–20cm long, comprising numerous multiflowered bracteoles. White 5mm flower with wide elliptical petals, the labellum with a clear sac at the base. New Caledonia, Vanuata, Fiji, Samoa? Tonga? humid forests, rarely scrub; on trunks or branches, sometimes high. Spring and summer flowering (Figure 3; Plate 1).

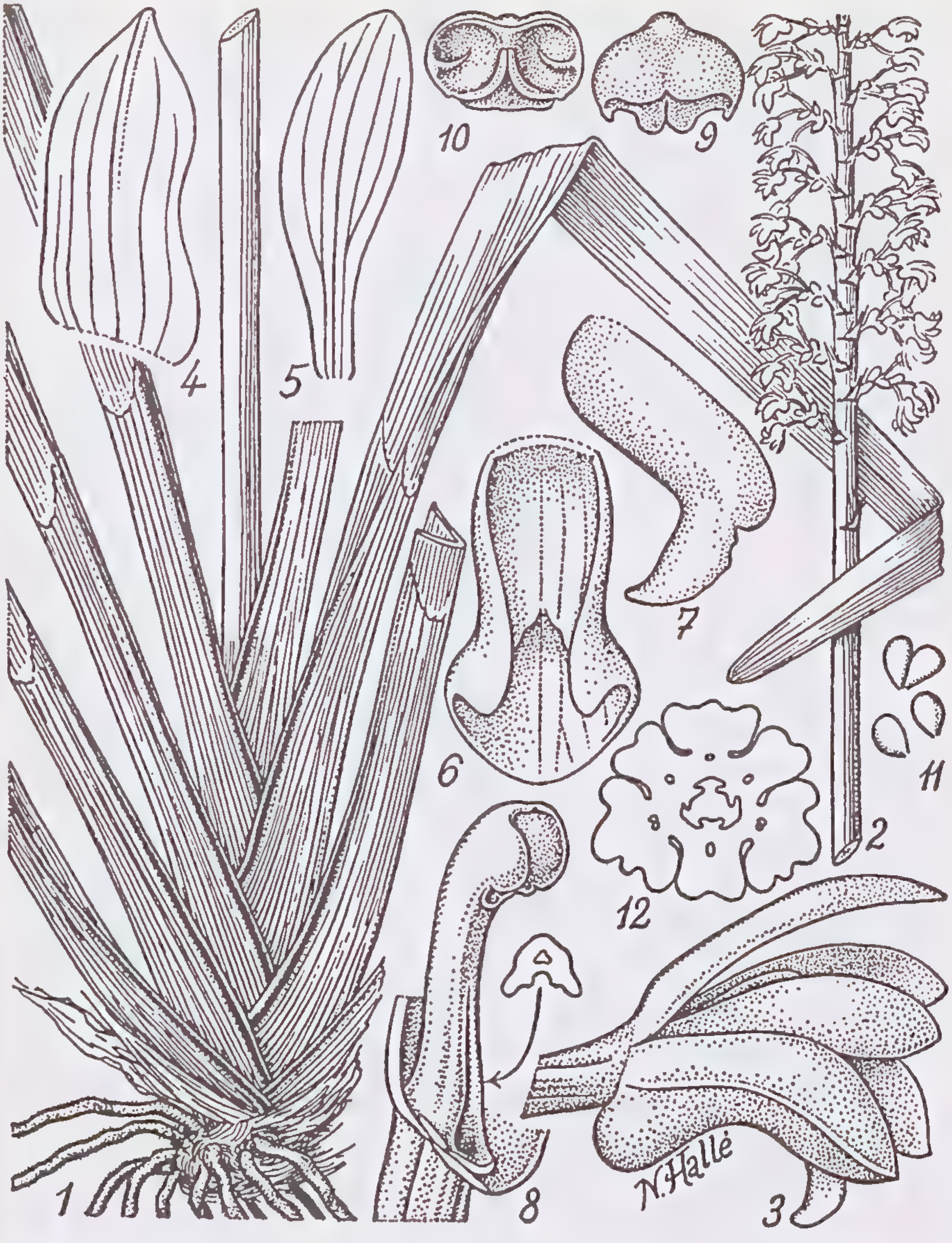
*E. floripecten** is very similar, but is a terrestrial, with spatulate petals, the labellum base concave but not clearly saccate, the base of the column conspicuously grooved. New Caledonia: rocks, bushy slopes, scrub. Flowers November (Figure 4).

*E. deplanchei** is a terrestrial (rarely epiphytic), with a stiff 4–10mm diameter stem, "like a little bamboo". Long scape, 4–13cm beyond the last leaf. White, yellow or green flowers, or



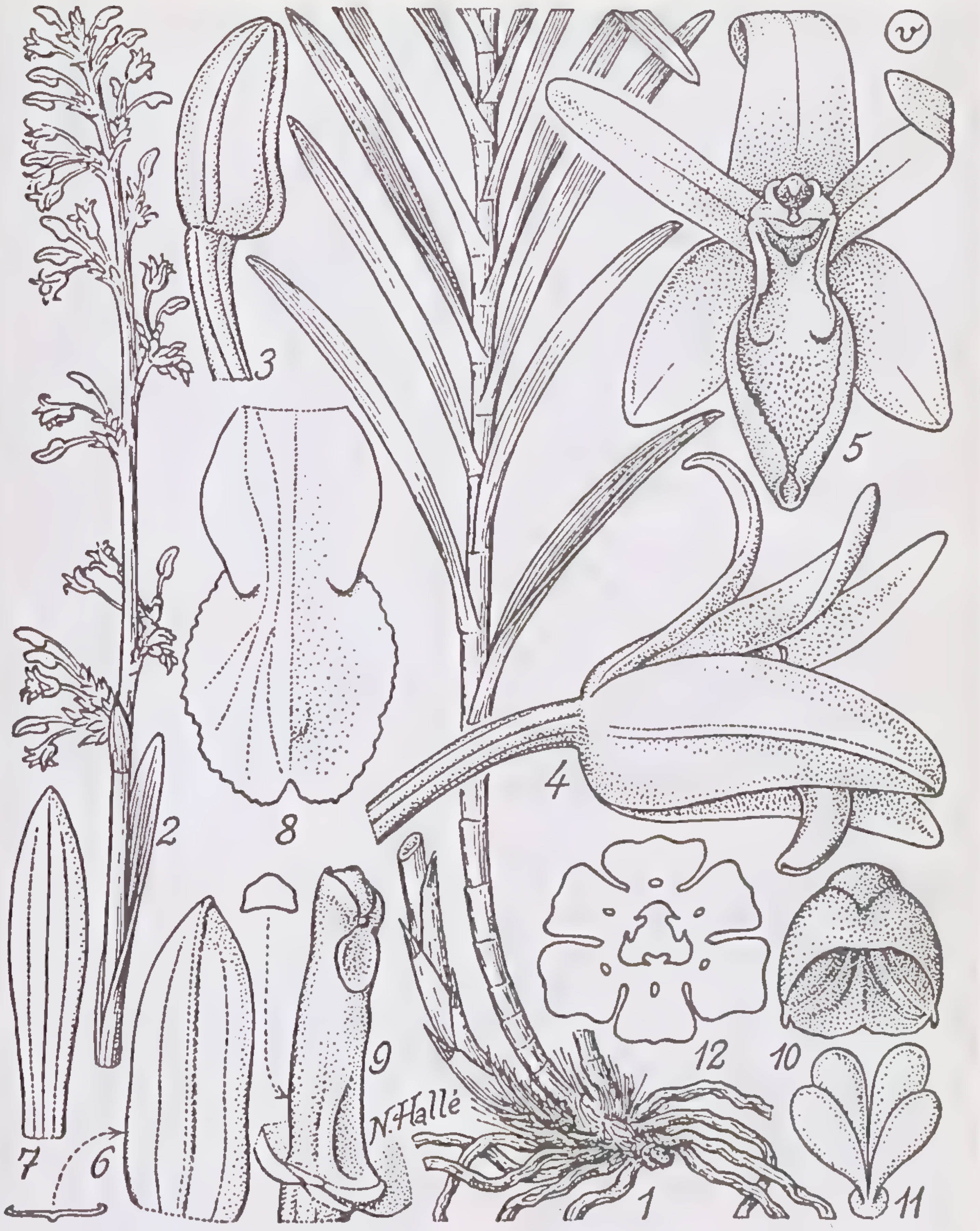
Pl. 128. — **Earina valida** Reichenb. f. : **1**, base de l'appareil végétatif × 0,66; **2**, extrémité d'une feuille × 1; **3**, inflorescence × 0,75; **4**, fleur, sépale médian 4 mm; **5**, fl. vue de face; **6**, pétale 4,4 × 2,7 mm; **7**, **8**, labelle, profil et face, env. 5 × 3 mm; **9**, colonne, long. env. 4,5 mm; **10**, anthère, de face, 1,3 mm; **11**, pollinie, 0,5 mm; **12**, graine, 0,15-0,2 mm; **13**, jeune inflorescence. — *MacKee 16432*, sauf : 8, 10, 11, *Vieillard 1298;* 12, *MacKee 26884*.

Fig. 3: *Earina valida:* drawing by Nicholas Hallé, 1977.



Pl. 129. — **Earina floripecten Kränzl.** : **1**, base de l'appareil végétatif × 0,66; **2**, inflorescence × 0,9; **3**, fleur, sépale médian 5 mm; **4**, sépale latéral 5 × 2,5 mm; **5**, pétale 6 × 2 mm; **6**, **7**, labelle, face et profil, larg. 2,5 mm; **8**, colonne, long. 4,5 mm; **9**, **10**, anthère, face et dessous, 0,9 mm; **11**, pollinie, éléments de 0,5 mm; **12**, coupe de l'ovaire, diam. 1,2 mm. — *Franc 2413*, sauf : 4, 5, 12, *Virot 1400*.

Fig. 4: *Earina floripecten:* drawing by Nicholas Hallé, 1977.



Pl. 130. — **Earina deplanchei** Reichenb. f. : **1**, base de l'appareil végétatif × 0,66; **2**, inflorescence × 0,66; **3**, bouton 4,2 × 2,5 mm; **4**, **5**, fleur, vue latérale et face; **6**, sépale latéral 6 × 3 mm; **7**, pétale 6 × 1,2 mm; **8**, labelle vu de face, à plat, 6 × 3 mm; **9**, colonne, long. env. 4 mm; **10**, anthère, vue antérieure, 0,7 mm; **11**, pollinie 0,5 mm; **12**, coupe de l'ovaire, diam. 1,5 mm. — *MacKee 24502*, sauf : 1, *Cribs 1286;* 8, 12, *Buchholz 1263*.

Fig. 5: *Earina deplanchei:* drawing by Nicholas Hallé, 1977.

yellow-green with a cream labellum, grouped on dense little lateral pannicles. Sepals 6mm long, very straight column. New Caledonia: high places, ferrugenous soils, more or less in the open, rarely in the forest. Flowers October-December (Figure 5; Plate 2).

E. mucronata forms grassy mats on well-lit branches and trunks. Each stem carries many tiny flowers in drooping clusters. Flowers creamy-yellow, 0.8mm wide, oval petals and sepals. Lip orange, broad and lobed at base and outer end, narrow isthmus between. Leaves slender and pointed, like stiff grass. Roots form thick tangled mass on bark. Throughout New Zealand; flowers November-December (summer-flowering in some areas) (Figure 1; Plate 3 and 39).

E. autumnalis is an epiphyte. Stem stands up if short, but may droop to a metre long; covered with stiff, 4–10cm narrow pointed leaves; flower stem turned upward if long and drooping; many white, 0.5cm flowers, heavily scented, broad oval petals and sepals; broad, yellow-based lip. Throughout New Zealand; flowers February-July ("Easter orchid") (Figure 2; Plate 3).

E. aestivalis is coastal, similar to *E. mucronata* with racemes of larger, darker flowers; more robust habit with shorter, boarder leaves. New Zealand: apparently confined to west coast from Northland perhaps to Fiordland; also the Chathams. Flowers January-February. There is still doubt as to the validity of this species: *E. mucronata* is variable in habit and colour, and may flower in spring and summer.

* The descriptions of *E. valida, E. floripecten* and *E. deplanchei* are roughly translated from Hallé[13].

SUMMARY

Earina is a Pacific island genus currently regarded as having two very different growth forms. Four species have slender, long, leafy, cane-like stems: the New Zealand *E. autumnalis, E. mucronata* and *E. aestivalis* and the New Caledonian *E. deplanchei.* Two have short, congested, rather fleshy stems completely obscured by the iris-like bases of the foliage: the New Caledonian *E. floripecten* and *E. valida* from New Caledonia, Fiji, Vanuatu, Samoa and perhaps Tonga. It is hard to understand why both forms are thought to belong to the same genus.

ACKNOWLEDGEMENT

I am grateful to Dan Hatch for translations, for his helpful comments and for showing me some of the historical material; to Phillip Cribb, Royal Botanic Gardens, Kew for permission to use his photographs; to the Museum of New Zealand Te Papa Tongarewa for permission to reproduce the Parkinson and Forster prints (Figures 1–2); and to the laboratoire de Phanerogamie, Museum national d'Histoire naturelle, Paris, for permission to reproduce the drawings from Hallé[13] (Figures 3–5).

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AROUND THE GROUPS

A.N.O.S. VICTORIAN GROUP 25th ANNIVERSARY CELEBRATIONS

Friday, 3rd September, 1993.

(Condensed from the report in the Victorian Groups Monthly Bulletin)

Our 25th Anniversary was celebrated in great style. The Herbarium was a hive of activity and conversations buzzed as we caught up with old (and new) friends.

We were delighted to welcome many important visitors, including Hermon Slade from Vila, Vanuatu (Co-founder, with Gerald McCraith, of the Australian Orchid Foundation); Mark Clements and David and Barbara Jones from Canberra; Wal and Jill Upton and Ron, from the Central Coast of N.S.W. and (representing N.O.S.S.A.) Roy Hargreaves from Adelaide.

Inspired by the article Australian Native Orchids on Badges in the Winter issue of *The Orchadian,* we designed a badge to commemorate our milestone, this distinctive badge depicted *Diuris fragrantissima* (Plate 30).

Don Smith, Immediate Past President was obviously taken by surprise when our President, Alex Wild, presented him with the Group's highest honour, Life Membership. Don joined the Committee in August, 1983, as Treasurer; in May, 1984 he become the Society's Secretary and in August, 1987 he was elected President, a position he held for four years. Don's enthusiasum, meticulous bookwork and acute business sense have been great assets for the Society.

When the committee was planning the 1993 programme, much consideration was given to the speaker who would make the 25th Anniversary meeting really special. Someone said, "Let's have fun — how about asking Graeme Carr!"

Graeme a member of our group for many years is President of the Orchid Species Society and is a one-eyed, dyed-in-the-wool species orchid fanatic.

Graeme's talk started off on a "high note" — his little brown paper carry bag contained several large cloves of garlic which he placed amongst the hybrids on the bench — "to ward off any evil".

Graeme wanted to present a talk we had not heard before and he was restricted to a topic on native orchids. After reviewing newsletters covering our 25 years, he told us: "I shall talk about native orchids — native orchids around the world". By this time we were all aware Graeme had a highly developed sense of humour. He showed us slides of orchid habitats around the world and orchids of an incredible range of shapes and forms.

It was soon time to turn on the lights and set up the supper table in the middle of the hall. Alex was then given the enjoyable task — cutting our birthday cake made and decorated by Olive Killian. We then enjoyed a scrumptious banquet-style supper supplied by our members.

A.N.O.S. VICTORIAN GROUP COUNTRY MEMBERS AND VISITORS DAY SATURDAY, 4th SEPTEMBER, 1993

Members and visitors from New South Wales, Canberra, South Australia and from Victorian country towns, came to Melbourne and joined metropolitan members for our first ever Country Members and Visitors Day.

The morning session was devoted to the beginner grower. John Evans and Doug Lee started the ball rolling with *An Introduction to Growing Epiphytes.* Their talk covered all the basics for cultivating epiphytes on mounts or in pots.

After a short break, Helen Richards presented *An Introduction to Growing Terrestrials.* Helen's slide-illustrated talk covered the distribution of terrestrial orchids; the growth cycle of a Victorian terrestrial orchid; potting mixes and the culture of terrestrial orchid species.

During the lunch break botanists Stephen Forbes and Andrew Batty showed small groups through the *Caladenia* Project Laboratory and explained the work they are doing at the Herbarium.

John Evans was also busy during the lunch break — he had a sizeable group gathered around him to learn the intricacies of deflasking.

After lunch Tony Slater presented *The Hidden Parts of an Orchid Flower.* Bringing to life this most interesting and diverse family.

Victorian Terrestrial Orchids, a slide-illustrated overview by Malcolm Thomas, concluded the day's activities.

We had a wonderful day . . . those who came along expressed their approval by congratulating us and saying that they learnt a lot . . . and will definitely be coming to our new Country Members and Visitors Day.

A.N.O.S. OF WESTERN AUSTRALIA

Ross Wilton

The A.N.O.S. of W.A. entered their first display in the Forest Place Championship Show that was sponsored by the City of Perth and held from 29th August to 4th September, 1993. The theme of the show was "Way Out West" and a gold mine with "speciosums" was used as the basis of the display. (Plate 40). Much to the delight of all members the entry was awarded first place and the $1,000 prizemoney provided an unexpected boost to the Society's funds. (We can now round off to the nearest dollar).

The display was the result of a combined effort of all members; however, special mention must be made of the contribution made by Darryl Graham, President, who fabricated the head frame and the name sign. (The writer now has to find another piece of timber on which to mount some plants). The Society was formed at the end of 1992 and it was thought that an entry in the show would provide some publicity for the Society — this was achieved.

Several members gained first or second placings with their species and hybrids in competition with all exhibitors. It was a very successful first effort for the Society and now members are looking forward to boosting funds at next year's show. ✾

A.N.O.S. JUDGES FOR QUEENSLAND

The A.N.O.S. Judging School, held in Brisbane, has been satisfactorily concluded with the practical and theoretical examinations being carried out on the occasion of the Second Australasian Native Orchid Conference and Show in Toowoomba.

Three judges were provisionally appointed; subsequently confirmed by A.N.O.S. Council, namely — John Hazelwood, Convenor of the A.N.O.S. Provisional Judging Panel for Queensland, John Woolf and Lester Radcliffe.

The theory papers of approximately 12 student judges are currently being marked in Sydney. ✾

A.N.O.S. SYDNEY GROUPS PRIZE WINNING DISPLAY AT TOOWOOMBA

Michael Harrison
President, A.N.O.S. Sydney Group Inc.

The Second Australasian Native Orchid Conference and Show was a great success for A.N.O.S. Sydney Group. We transported our plants over 1,000 kilometres to get there, then built a marvellous display to feature them and finally had the pleasure of seeing our display win first place. We also had both Grand Champion and Reserve Champion Orchids in our display. No wonder we spent the entire time in Toowoomba walking around with silly grins on our faces.

Transporting our plants and materials up to Toowoomba was made relatively simple thanks to those members who volunteered the use of their vehicles. They arrived safe and sound without any problems.

By 9.00 a.m. on the Thursday morning we began assembling the display. The whole process proceeded smoothly and the display came together naturally. This is not to say that there was no effort or expertise involved. Our people worked practically all day and those O.S.N.S.W. Winter Show displays we have been doing for the past couple of years gave us the experience and confidence we needed. We constructed the display on two levels. Against a lattice backdrop, upon which we hung a number of pendulous, raft-cultured plants, we first built a raised section featuring our larger and taller specimens and then brought the display down to floor level, with a couple of raised "island" sections in the front to feature botanical and terrestrial exhibits.

We finished it off with ferns, bark, natural log edging and carefully positioned sphagnum-like moss to cover any remaining bare patches. The finishing touch was to pack the lattice backdrop with moss in the shape of a decent likeness of our fair land.

Judging was carried out on the Thursday night and in all we won six champions out of the ten that were awarded (see Second Conference Show Report on page 90).

Dendrobium Star of Riverdene 'Amanda' was granted an HCC/ANOS and *D.* King-Wong 'Striker' achieved an Award of Distinction/ANOS for colour and habit of inflorescence.

I rang Ron Findlater to tell him the good news and congratulate him. It was around midnight and he did sound a bit drowsy, but once he realised why I was calling, he perked up a bit, to say the least. I also got the impression that the $1,000 Grand Champion prizemoney would be welcome. He later told me that he wasn't able to get back to sleep until nearly 3.00 a.m.

Apart from those members who actually went to Toowoomba and assisted with the display, we could not have done it without the support of those who trusted us to take their valuable plants to Queensland and back. In all, we had well over 100 plants on display, representing the participation of 20 members of A.N.O.S. Sydney Group, directly or indirectly. It was a marvellous effort and I feel very proud of our Group and our members. ✾

OBSERVATIONS ON THE POLLINATION OF *CALOCHILUS CAMPESTRIS* R.Br.

By C. C. Bower, P.O. Box 300, Orange, N.S.W. 2800
and P. Branwhite, 196 Olive Street, Albury, N.S.W. 2640

SUMMARY

The interaction between a male scoliid wasp, *Campsomeris tasmaniensis* and a flower of the Copper Beard Orchid, *Calochilus campestris* R.Br. is reported and illustrated by photographs. The behaviour of the wasp was consistent with the pseudocopulation pollination mechanism.

INTRODUCTION

The Beard Orchids, genus *Calochilus* R.Br., are among the more unusual and attractive of Australia's terrestrial ochids. Most of the ten species currently recognised (Clements, 1989) have prominent labellums covered in long, dense, lustrous reddish or bluish hairs. Inflorescences consist of racemes of a few, or up to 20 flowers on a single erect stem. Despite the relative abundance of some *Calochilus* species and their showy displays, there are only two previous reports of pollination by insects (Fordham, 1946; Jones and Gray, 1974). All species undergo self-pollination if insect mediated pollination does not occur (Jones and Gray, 1974), thereby ensuring high levels of seed set. The relative importance of insect and self-pollination is likely to vary between species and some may be entirely self-pollinating. Male wasps in the scoliid genus *Campsomeris* are the only reported pollinators of both *Calochilus campestris* R.Br. (Rupp in Fordham, 1946) and *C. caeruleus* L. O. Williams (recorded as *C. holtzei* F. Muell. in Jones and Gray, 1974). Jones and Gray (1974) concluded that *C. caeruleus* and *C. campestris* belonged to the pseudocopulation pollination syndrome.

In this article we report observations on the pollination of *C. campestris* made by one of us (PB) at Albury, N.S.W. in October, 1988, along with key photographs from a series taken of the event.

OBSERVATIONS

Whilst photographing a flower on another plant on a warm sunny day a large yellow and black wasp was observed to land on the labellum of a nearby fresh *C. campestris* flower. Over the next two to three minutes a series of ten photographs were taken showing the various interactions of the wasp with the flower. Plates 5 to 10 are from this series. A conscious effort was made to record all the different positions of the wasp on the flower.

POLLINATION OF *C. campestris*

The following account of the event is constructed mainly from the photographs aided by recollection. The first photograph (Plate 5) shows the wasp on the labellum with his abdomen curled below. The genital claspers at the tip of the abdomen are partially open and show the wasp is a male. The claspers are adjacent to the narrow strap-like labellum apex. There is no pollen on the wasp and an intact pollinium is clearly visible in the anther at the top of the column. The wasp's wings are moving rapidly.

The wasp then quickly entered the flower, pushing its head below the angled column (Plate 6). This action dislodged the friable pollinia from the anther, smearing fragments onto the face of the wasp between the bases of the antennae. At this point the wings are still and the abdomen remains curled below the labellum. The wasp then backed out of the flower (Plate 7) with wings waving vigorously. Large fragments of pollinia are obvious on the face of the wasp and a small one is stuck to the upper edge of the near petal. The wasp then moved below the flower (Plate 8) and rested briefly. Plate 8 shows the absence of pollinia in the visible side of the anther in comparison with Plate 5.

The wasp then remounted the labellum with wings waving rapidly (Plate 9), its abdomen again curled below in the vicinity of the labellum apex. However, neither of the two photographs of the wasp re-entering the flower show its head below the column or in the vicinity of the stigma. Following the second entry, the wasp backed out and flew away after resting on the outside of the flower. The final photograph (Plate 10) shows copious pollen

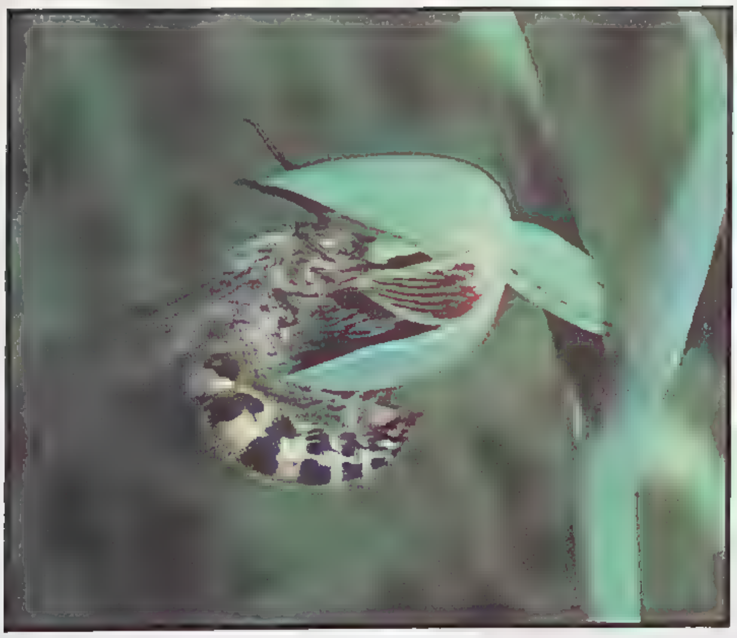
Plate 5

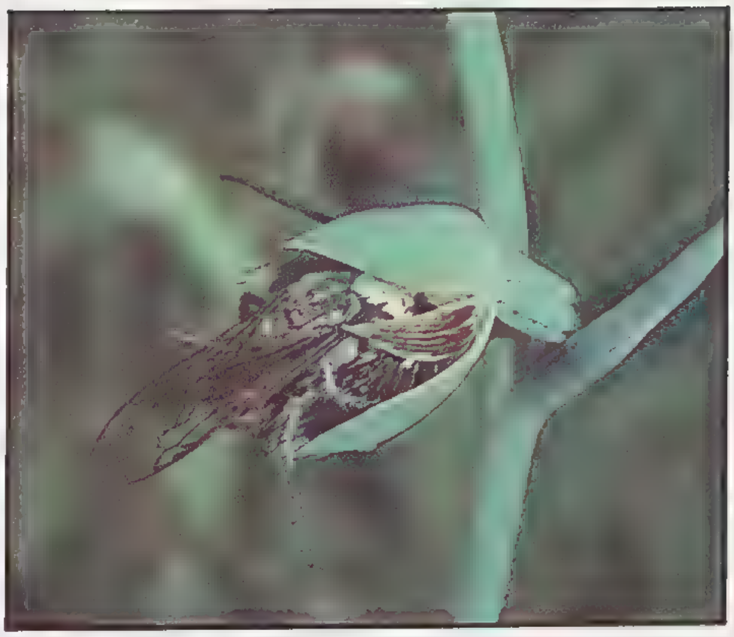
Plate 6

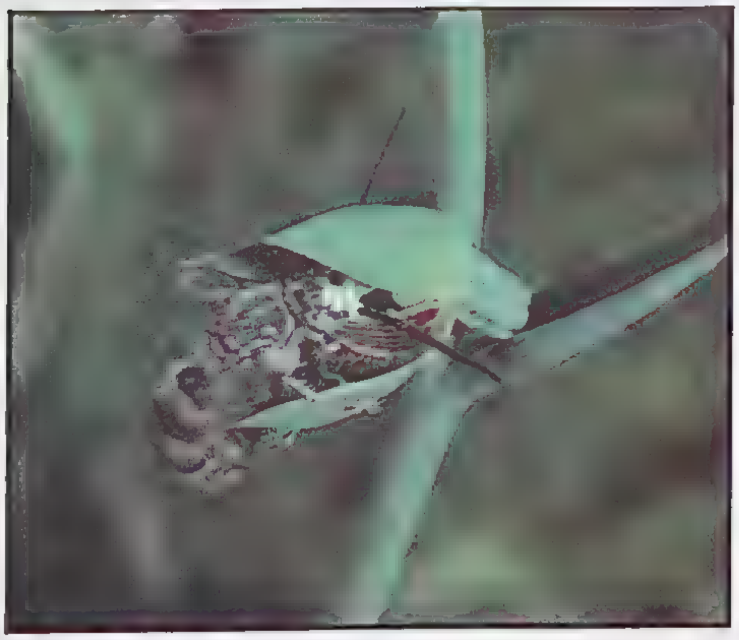
Plate 7

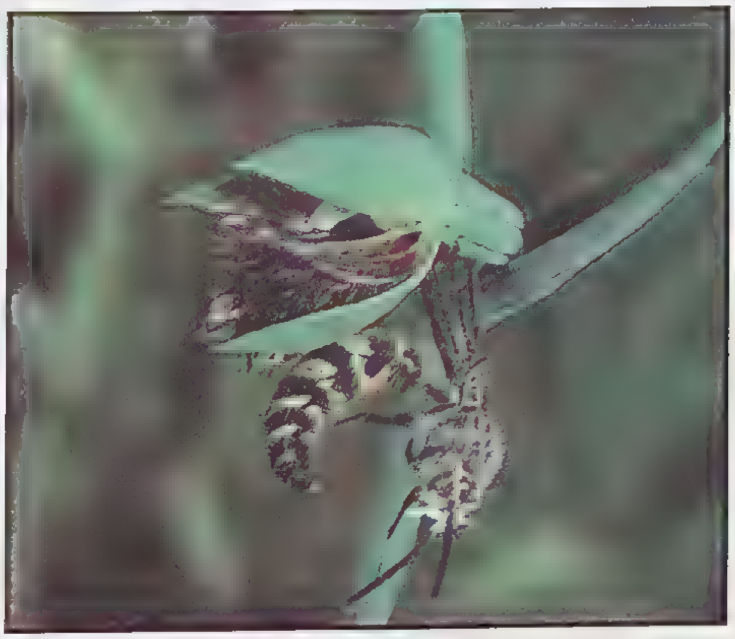
Plate 8

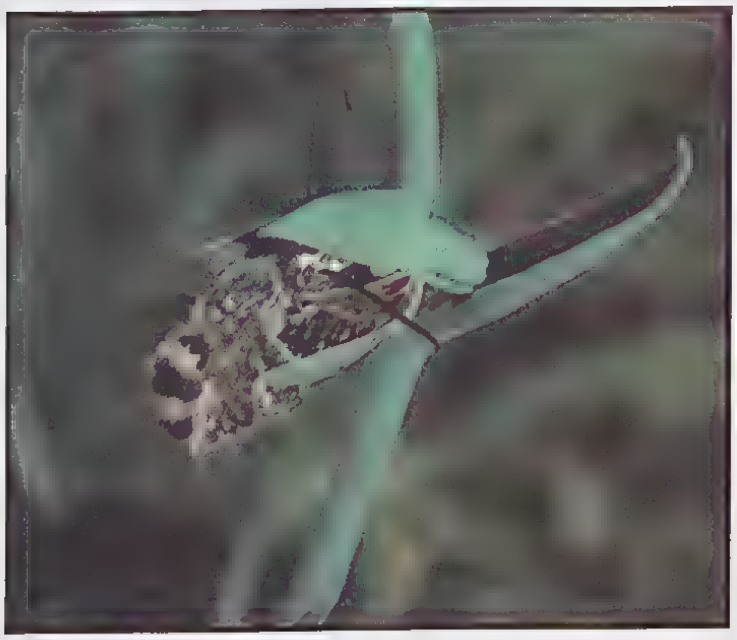
Plate 9

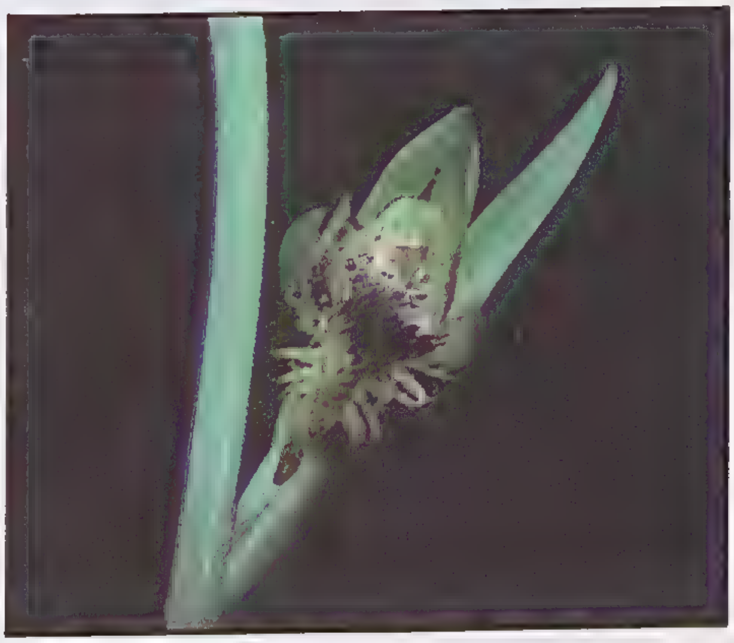
Plate 10

Pollination of *Calochilus campestris* by *Campsomeris tasmaniensis.*
Photos: P. Branwhite

fragments smeared over the stigma with a dusting of particles at the base of the labellum and on the column. An additional photograph, not reproduced here, showed complete removal of the pollinia from the anthers.

The acitivity of the wasp on the flower was vigorous with waving of wings and abdominal probing. It is not known if there was pollen on the stigma prior to this wasp's visit, so these observations do not show conclusively that it pollinated the flower. However, there is no doubt that it removed the pollinia from the anthers. At least one pollinium was intact in the anthers before this wasp's visit, so it is probable there had been no previous visitors capable of causing pollination. It is therefore most likely that pollination resulted from the observed visit. If so, the photographs suggest it occurred on the first entry to the flower rather than the second where the wasp's head does not appear to have reached the stigma.

The wasp in the plates was not captured, but comparison with mounted specimens indicates it is the common scoliid, *Campsomeris tasmaniensis.*

DISCUSSION

The above account is remarkably consistent with observations made by Fordham (1946) in September, 1945. Over two mornings he observed nine visits by dark, yellow-banded wasps to flowers of *C. campestris* placed in a vase on his verandah. Two were captured, one with pollinia on its forehead and identified as males of *Campsomeris tasmaniensis* (see foreword by Rupp to Fordham's (1946) paper).

Fordham (1946) observed the wasps to land on the labellum of the flowers and make "stabbing movements, as if . . . stinging the hairless ribbon" at the labellum apex. They also stroked the hairs on the labellum with three appendages at the tip of the abdomen, which Fordham took to be stings, but were in fact part of the genitalia. The behaviour observed by Fordham (1946) is clearly attempted copulation, suggesting the hairy labellum is a mimic of the female wasp. In attempting unsuccessfully to couple with the labellum the male pushes its head forward below the overhanging column. Fordham observed both removal of pollinia from the anther and deposition of pollinia on a virgin stigma, thereby confirming *C. tasmaniensis* could effect pollination. Three wasps bearing pollinia visited Fordham's flowers, all with the pollinia on the forehead.

Pollination of *Calochilus caeruleus* in far northern Australia parallels that for *C. campestris* (Jones and Gray, 1974). The pollinator is the male of an undescribed species of *Campsomeris* with similar behaviour on *Calochilus caeruleus* flowers to that of *Campsomeris tasmaniensis* on *Calochilus campestris.* Male wasps usually approached *C. caeruleus* rapidly and directly, just above grass height and circled the flowers a few times before landing. They were also able to locate concealed flowers indicating attraction by odour rather than sight. Jones and Gray (1974) suggested *C. caeruleus* emits a sex attractant perfume, or pheromone, which is specific to the *Campsomeris* pollinator. No other insects were attracted and *Calochilus* flowers produce no nectar.

Jones and Gray (1974) noted that the actions of *Campsomeris* sp. on *Calochilus caeruleus* tended to break up the friable pollinia and push a large proportion straight onto the stigma. The observations given above suggest this also happens with *C. campestris*, though confirmation is needed. This suggests that *Campsomeris* pollinators merely accelerate the facultative self-pollination of *Calochilus* flowers. However, in all cases a significant amount of pollen is also removed on the wasps for cross-pollination of other plants (Fordham, 1946; Jones and Gray, 1974; Plate 7 above), thereby promoting some outbreeding.

The observations reported here support the conclusion of Jones and Gray (1974) that *C. campestris* is pollinated by the sexual deceit or pseudocopulation mechanism. Interestingly, van der Pijl and Dodson (1966) used Fordham's (1946) suggestion that ♀ *Campsomeris* *tasmaniensis* was attempting to sting the flower to support the creation of a "pseudoparasitism" pollination syndrome. This followed from the fact that female scoliids are parasitic on beetle grubs in the soil and paralyse each victim by stinging before laying an egg on it. However, both van der Pijl and Dodson (1966) and Jones and Gray (1974) overlooked the foreword to Fordham's (1946) paper in which H. M. R. Rupp noted the wasps had been identified as males by K. C. McKeown of the Australian Museum. This precludes the possibility of pseudoparasitism.

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SECOND AUSTRALASIAN NATIVE ORCHID CONFERENCE – TOOWOOMBA – 16th-19th September, 1993

Walter T. Upton

The Committee of The Native Orchid Society of Toowoomba Inc., have proved themselves to be great achievers, the success of the second conference is due to them, the only losers are those who did not attend.

It was a success from all points of view, particularly the social side. The atmosphere at the conference was most pleasant, cheerful, welcoming and warm.

The well attended lecture programme was balanced with talks on culture, terrestrials, epiphytes, species, hybrids, in vitro germination of orchids, research, pollination, conservation, etc., from the leading native orchid speakers from the U.S.A., New Zealand, New Guinea, Qld., N.S.W., S.A. and W.A. The erudite knowledge portrayed was, I am sure, indelibly recorded in the minds of the registrants participating. The slides shown were of a high standard. The proceedings are available from The Native Orchid Society of Toowoomba Inc., P.O. Box 2141, Toowoomba, Qld. 4350 or from A.N.O.S. Council, see advert. on page 93.

The University of Southern Queensland was an ideal venue for this kind of function and from an outsider's point of view, the co-operation received from the University was great, all seemed to flow smoothly as a well oiled machine.

The show was in the Basketball Stadium (Plates 21 to 23), a quality show, despite the lack of support from some native orchid groups. It was, however, pleasing to see that A.N.O.S. Sydney Group brought up car loads of plants from Sydney to present a winning display. The show results are shown under "Around the Shows" on page 90.

The Official Opening and Welcome Brunch was at "The Club", a delightful smorgasbord brunch in very pleasant surroundings with entertaining and informative speeches. The Mayor of Toowoomba Alderman Ross Miller declared the Conference open. The Banquet on the Saturday night was in the McGregor College Dining Hall, Wayne Harris the Master of Ceremonies ensured all ran smoothly. Our after dinner speaker was well known Victorian member Helen Richards, who spoke on orchid personalities she had met. The first order of the night was to upturn one's chair to see if the word "Prize" was on the underside of the seat, guess whose chair obliged? That's right my wife Jill — a painting of *Sarcochilus falcatus* by Sandra Miller was the prize, thanks.

The Farewell Aussie Barbecue was at the Japanese Gardens (Plates 11 to 20), a superb setting amongst lovely landscaped gardens, including a lake with an island and ducks. Over the barbecue area a free standing pergola covered with a lavender blue wisteria in full bloom. Add to this a perfect Queensland day, a joyous and friendly atmosphere, plus good "Aussie Tucker" (Plate 17) and we have the ingredients for a Utopian ending to an excellent native orchid get-together, conference and show.

Eat your hearts out for not attending and make sure you are at the next one.

Thanks to the Conference and Show Committee — Clarrie Wuth, Chairman; Russell Kanowski, Secretary; Phillip McKenzie, Treasurer; Beverley Cummings, Neville Douglas, Noel Grundon, Wayne Harris, Neville Rosenberger and John Woolf — you are to be congratulated for a job well done and done well.

SECOND AUSTRALASIAN NATIVE ORCHID CONFERENCE – TOOWOOMBA – FAREWELL EVENT – AUSSIE BARBECUE

Plate 11: Japanese Gardens – looking toward barbecue area.

Plate 12: Barbecue area – an ideal location.

Plate 13: Wayne Harris – well earned lunch.

Plate 14: John Woolf with banana or banana with John Woolf.

Plate 15: Clarrie and Beryl Wuth.

Plate 16: Dr Noel Grundon.
Photos: W. T. Upton.

Plate 17: John Andrews on a diet.

FAREWELL EVENT – AUSSIE BARBECUE

Plate 18: Bob Napier and Neville Howcroft.

Plate 19: Peter Eygelshoven and Barry Collins.

Plate 20: Darryl and Allison Smedley, Reg Matthews and John Hazelwood.

SHOW VIEWS

Plate 21: Nosti's Display – backdrop by Sandra Miller and Josie Wright.

Plate 22: General view of Show.

Plate 23: Specimen plants at end of centre displays.

Photos: W. T. Upton.

MYOLA WITH THE ORCHID SOCIETY OF PNG

Phil Spence
149 Plateau Road, Bilgola Plateau, N.S.W. 2107

April, 1993, Saturday morning, five o'clock. My partner, Byron Fear and I woke to the loud high-pitched squeal of my portable alarm clock. Byron bounced out of bed and straight away put on the kettle, while I crawled out of mine and went to the shower. At six o'clock, Byron and I met with the members and guests of the Orchid Society at Milne Bay Air Terminal, Port Moresby. We were the lucky people for whom the orchid society had arranged this weekend away.

Renewing old friendships and saying hello to new faces, then off to the holding room. Actually, it was an open air enclosure with several hard wooden benches. Time started to tick away, our quick departure on a charter aircraft, 20 seats, turned into a typical Moresby time delay. All passengers present with baggage, the plane was ready to go, but no pilot. Guess what? "He's slept in, but have no fear, he's on his way. Someone has got him out of bed". He arrived; a further delay while he found a headset that worked. We taxied onto the airstrip for take-off.

Very quickly the plane gained enough altitude to see, where we could, the landscape below. The plane heading north-east passed almost directly over Varirata National Park. There, several years ago, many cliff faces were covered with *Bulbophyllum fletcherianum* and *Dendrobium mirbelianum.* Sad to say most of these species have disappeared along with many others. This I believe has been the result of large scale collecting for commercial purposes. About two years ago I visited these cliffs and was pleased to see that the orchids had started to regenerate. While we were discussing this the plane was passing through the ever present cloud bank.

Twenty minutes later, we started our descent through an opening in the clouds. Low mountains densely covered with rainforest, trees and shrubs surrounded a large flat heavily grassed swamp valley floor. To one side of this sunken plateau was a small winding river, I would estimate 10 metres across. According to the plane's altimeter the mountains were 7,000 ft above sea level while the swamp was about 5,800 ft. Before I could take in any more of the scenery, the pilot was turning the plane for a second pass over the swamp. He called out, "Can anybody see the airstrip?" The pilot, tongue in cheek, explained that he had never landed at Myola before. No sooner had he finished telling us this than the newly promoted co-pilot, Jacque Ware, said, "there is the white wind sock!" Quickly the pilot turned the plane hard left and barely having the plane straightened up, the wheels touched the grass of the strip. Rapidly he throttled back and brought the plane to rest near a small village, constructed of grass and bamboo. Wolfgang Bandisch opened the door. Once on the ground, we all quickly sorted out our baggage and started to the village to meet our hosts for the next two days (Plate 24).

At the edge of the village stood a small tree, with a few orchids growing on it. I recognised *Dendrobium terrestre,* while thinking to myself this place looks promising. I was disturbed from my deep thoughts by Fiona Tanner. Fiona, who had been to Myola before, was telling everyone, "Don't put down your bags and sleeping bags, but go to the long hut, second from the end. The bamboo rooms in the long hut have two and a few have three bunks so pick a friend or two to share a room. Then get changed ready to go to the mountain behind the village where we can see a waterfall. When ready, meet at the table with the grass roof for a hot drink and something to eat".

Byron and I moved into the first room we could find that was not occupied, changed our clothes and off to the mess table. No one had arrived yet, except Jacque who was arranging the food and drink with our national hosts, so we walked over to a large tree. There to our surprise was a *Dendrobium subclausum* in full display, very colourful with its bright yellow and red tubular flowers. Next to *D. subclausum* was a small *Cadetia* species. It was obvious to me that these plants had been rescued and placed here to survive as best they could.

A cuppa with brunch had been prepared so it was time to eat. I won't go into the meals except to say many thanks to Jacque and our indigenous cooks.

Most of the group packed a few meagre rations along with a drink into a bag or rucksack, then with cameras in hand we all started walking. Very easy going to start with, following a foot track used by the village people to enter the rainforest. Rapidly the track became a maze of tree roots. One constantly had to watch out where one trod, whilst still checking to see if there were any orchids growing on the trees. I sighted many different species. Most not in flower, except the odd *Bulbophyllum* species and the occasional *Epiblastis acuminatus* displaying its white to magenta flowers. The flowers came forth from the apex of the leaves like a set of organ pipes. All the time we could hear the gentle roar of a fast flowing river, just a few trees away. On turning the next bend I was confronted with a slippery log lying across the river. "Oh! Oh!" I could see myself slipping in because of my new boots, not yet broken in.

No mishaps. I was safely across the river. There, almost in front of me was a crystalline white flower on a small leafy plant firmly attached, about eye level, to a moss covered tree of considerable size, a *Glossorhyncha* (one of the more attractive of the genus). All across the river, we started upwards following the river for some distance. The whole of the forest, that is, the good host trees, were covered with *Bulbophyllum* species of all shapes and sizes.

I recognised *B. nitidum.* It was very difficult to recognise varieties, as many New Guinea species look the same without their flowers! Seeing a *Dendrobium* out of the corner of my eye, I thought it might be *Dendrobium fantasticum* (recently named by Dr Phillip Cribb "*D. woodsii*"). The closer I got the more it looked like the plant I was hoping to find. I have been drawing all the dendrobiums of the section *Latouria* for a book that I will complete one day or year, I hope! The plant was bearing a couple of flowers so my excitement rose as I climbed the host tree. Apparently this species was new to science! It belongs in a group of aberrant labellum, smaller growing *Latouria* dendrobiums. Its nearest species are *D. amphigenyum, D. dendrocolloides* and the closest of all *D. uncipes.* The centre fork on the labellum of *D. uncipes* is on a totally different elevation from the rest of the labellum. On this new one, the labellum is all on the one plane, also the colour is totally different. The rest of the group had noticed my excitement. With cameras at the ready, several people came to record my discovery. By now I was back on the ground scanning all of the surrounding trees. I can still hear them saying: "there's another and another and another! I have one over here!" Very quickly the excitement dispersed after removing two plants, with our village host's consent, for recording purposes.

Back on the track and a little further upstream, "Bingo!" A large specimen of *D. aemulans* with only a solitary soft violet flower. The plant was all of a metre in length. This species was common. By now the river had turned and opened out into a shallow broadwater way with lots of rapids that we all had to cross. Some just walked through the water while others chose to hop the stones. While laughing at each others' success or disaster, every one decided it was time for a break and a snack. Chocolate, water and biscuit, mix well, when you need

Plate 24: Huts and mountains – Myola.
Photo P. Spence

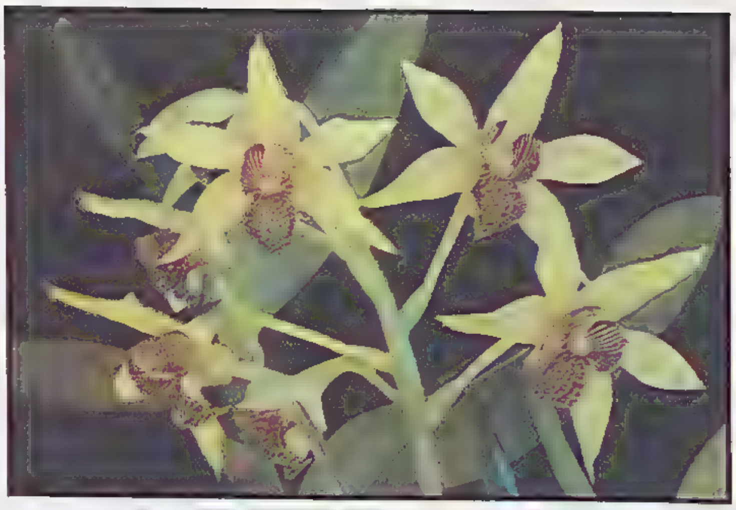


Plate 25: *Dendrobium engae.* Photo P. Spence

Plate 26: *Dendrobium* King Wong 'Striker'.
Photo W. T. Upton

Plate 27: *Dendrobium* Star of Riverdene 'Amanda'.
Photo W. T. Upton

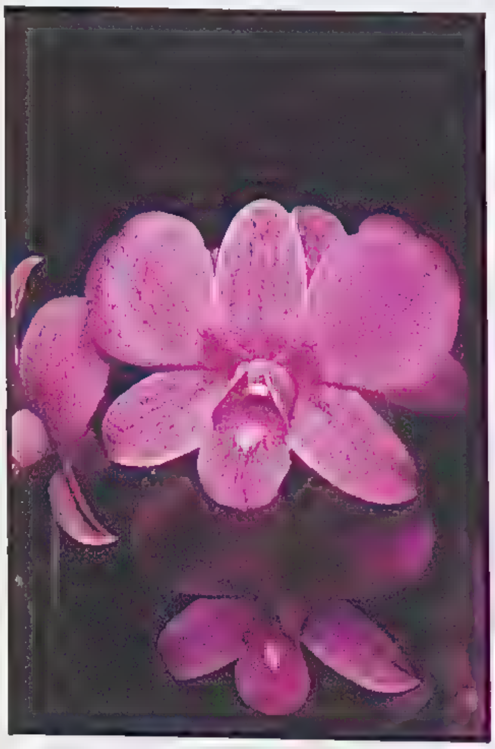


Plate 28: *Dendrobium Xleeanum* 'Barnham'.
Photo D. Titmuss

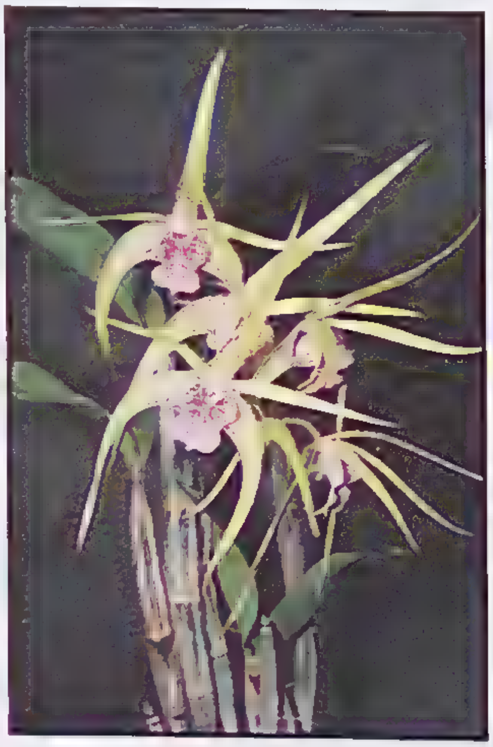


Plate 29: *Dendrobium* Regal Affair.
Photo D. Titmuss

Plate 30: A.N.O.S. Victorian Group 25th Anniversary.
Photo: W. T. Upton.

energy. After a short stop we set off again, a small group decided they would turn back, the rest pressed on.

Growing in the upper canopy of a tall tree was the largest *Dendrobium* we saw during the trip. It looked like *D. engae.* From here we climbed away from the river, scrambling up the steep hillside that appeared from nowhere! Few orchids for some distance, except the ever surprising terrestrial orchids, possibly, *Malaxis* species or similar (terrestrials aren't my scene!). We all scrambled up and down as the landscape undulated, always gaining altitude. We crossed another fallen tree that we used as a bridge; at the same time checking the trees for orchids. Every now and then we found a lone tree, fully laden with ferns, moss and orchids. Mentioning a few species, there were many different *Liparis, Oberonia, Glossorhyncha, Eria, Phreatia, Podochilus, Agrostophyllum, Bulbophyllum, Cadetia* and *Ceratostylis,* most only of botanical interest.

The waterfalls loomed up with their ever present roar getting louder as we approached, the mist dampening everything, including us. As the sun was directly overhead penetrating us with its warmth we did not worry. The falls were very large having four tiers with at least three separate cascades on each level. Through the mist, was the top of the mountain, it did look inviting. I searched the surrounding countryside but could not find anything of interest. No one was interested in climbing to the top, so I started off on my own. To reach the top I would need to skirt the falls and go through the thick shrubs on the steep hillside. It was easier than it looked, once under the first shrub I found that I could climb this steep embankment without too much trouble. The higher I scaled, the more promising the vegetation became. Trees started to have large clumps of moss hanging from their boughs. The main trunks of these stunted trees were covered with a large array of epiphytic orchids. Wet crevices in the rocks gave forth long shawls of sphagnum moss.

Before me lay a mound of dry moss which I dragged myself across only to find that the shrubs ended abruptly exposing a very large flat rock that would take me to the ridge of the mountian. Just short of the ridge there were several large rhododendrons that over-hung the other end of a semi-vertical rock. I could see orchids with bright colours growing on these trees. "Damn!" I can still hear myself saying, as from down below, came voices yelling for me to come back. It was time to turn back, I was sure that there were some good orchids growing on that ridge. *Dendrobium cuthbertsonii,* maybe even dendrobiums of the *Oxyglossum* type or even better still *Dendrobium terrestre,* with its beautiful sunset coloured flowers. "I will never know".

Everyone had started off down the mountain except Fiona and William, who were kind enough to hold back for me while I slithered down to them. I told them of my sightings and also about a *Glossorhyncha* species that had lime coloured flowers. We walked very briskly as we descended, sometimes slipping in the moist soil and sitting down when least expected. On one of these slides we had to duck under a fallen tree trunk. There on the opposite side to that which we had looked at on the way up, was a *Dendrobium cruttwellii.* It was not in flower, but when it does it will carry six to eight apple green, flecked with dark red, flowers 30 to 40 millimetres in diameter.

The group had just arrived at the rapids when we caught up. It was a spontaneous decision to have a well-earned break and finish the rest of our food and drinks. I was delighted to see all the intriguing botanical orchids hanging above the bubbling water of the rapids. One *Glossorhyncha* species and a *Dendrobium aemulans* stood out from the rest.

It's surprising how at this altitude your energy is quickly restored. I was interested in having a look at a small mud flat that had started to regenerate vegetation. The bark of the small trees was quite mossy. Our village guide stayed with me, while the group made their way back along the foot track to the village guest house. As soon as everyone was out of sight, he brought to my attention the largest *D. subclausum* I have ever seen. It was in full flower and the colour contrast was outstanding, buttercup yellow with beetroot would be an artist's gauge of colour.

Humidity had started to rise, I could tell, as the moss on the trees was moist to the touch. Leaving the mud flat we made good time down the slopes, looking at as many orchids as we could till we reached the camp.

After putting away our gear, it was 4.30 p.m., time to relax. After some food and coffee the bottles squeaked and the cans clicked. We won't talk about that except to say, it must have been the altitude, couldn't have been me! "Sorry". About ten o'clock I started feeling better. While sitting in the smokehouse, I looked out of the windows and took particular notice of the window props. These were old, almost rusted away rifles, left behind by the soldiers during the Kokoda assault.

The Orchid Society of PNG has a tradition in which everyone must partake. It is good fun, come along to the next outing to find out more! After a few long and lots of short stories everyone made their way to the bunkhouse and crawled into their sleeping bags to stop freezing. No one snored, it was just the wind!

Next morning nearly everyone was at the table bright and early. Toast, beans, sausages, weatties, tea and coffee; everyone joined in. We discussed what to do, there were two trains of thought. One group wanted to see the wrecked plane of yesteryear, while our group was to cross the swamp and look for orchids in the range of mountains.

Jacque, Fiona, William, Wolfgang, our guide and myself, walked for the full length of the airstrip, then just as far through very long grass. The ground was getting wetter and wetter all the time. Long tubular bull rushes started closing in on us and it was harder and harder to find a path through the reeds. The river, which we had observed from the air, was upon us and there was no way around or across it except to wade. Not knowing that we would be bitten by swamp mites — I was worried about wild pigs.

We all felt relieved, one and a half hours later, when we reached the grassy slopes of our inviting mountains. The trek up to where the forest started didn't take long. No sooner had we reached the trees than I found a large *D. engae* (Plate 25) again. In the same vicinity was a dwarf *Calyptrochilus* type *Dendrobium*. A stunted plant, although robust and showing vigour. The flowers were small, coloured yellow and orange. Wolfgang, with the help of William, made a good discovery. A small tuft of leaves like a posy and tucked under the leaves, yet viewable from any position, were numerous brown to apricot flowers with dark red labella. Each flower measured 15mm in diameter. On closer examination we could see small pseudobulbs. Truly stunning for a miniature, it was a *Bulbophyllum* species.

There were hundreds of miniature orchid plants, but only the occasional meat coloured flower and for that I needed a magnifying glass. We worked our way around the top end of the swamp, all the time checking the trees at the edge of the forest. Alas the orchids were only repetitions of those we had seen on the other side.

Time was flying by, our plane was due to land at three o'clock and fog was starting to cloud in the valley. Around the high end of the swamp was our shortest way. Again we could tramp across the swamp, the muddy roots of the water reeds constantly twisting our ankles.

Just before we started to enter the swamp I found a lone terrestrial. *Spiranthes sinensis,* with spiralling irridescent deep pink flowers winding around a grass-like raceme. Then Jacque found a *Thelymitra* species, as did Wolfgang. Then they were everywhere, few were open as the fog had stopped the sun from reaching them.

By the time we had crossed the swamp our charter plane had landed to take us all back to Port Moresby. The pilot informed us as we walked with him to the village, that he was much earlier than anticipated, as he had been advised to lift us out before the fog closed in, otherwise it would be impossible until tomorrow. "Twenty minutes, that is all you have and by then we have to be off the ground!" No-one needed telling twice.

Much to see after a good take-off, as the clouds were only over Myola. Lush green hillsides and mountains, many with villages on top. Some had small airstrips. The half an hour flight came to an end. We collected our bags and said many thanks to the committee and a tired goodbye to all.

It was three o'clock. ⁂

BOOK REVIEWS

ORCHID MONOGRAPHS, VOLUME 7.

A Taxonomic Revision of *Bulbophyllum,* Sections *Adelopetalum, Lepanthanthe, Macrouris, Pelma, Peltopus* and *Uncifera* (*Orchidaceae*).
By J. J. Vermeulen.
Published by Rijksherbarium/Hortus Botanicus, P.O. Box 9514, 2300 RA Leiden, The Netherlands.
248mm x 170mm, soft cover, 332 pages, 122 superbly executed drawings of species plus six of maps. 24 colour pictures. ISBN 90–71236–17–X.
Price: Dfl. 100.00.

This detailed monograph presents a revision of six sections of the genus *Bulbophyllum.* Five sections mainly occurring in New Guinea and the other section *Adelopetalum* almost confined to Australia.

The series is an important source of information on the orchids of south-east Asia and Australasia and this volume is of the same high standard as previous volumes. All aspects are treated in great depth from the introduction, taxonomic history, materials and methods, species concept, cladistic analysis. Biographical analysis of the revised sections and cultivation to the actual revision. It covers 110 individual species and nine subspecies (47 species and four subspecies are new).

The format for each species description is constant and includes full synonymy and literature references followed by the comprehensive description, then colours, ecology, distribution and notes.

Each figure is well executed showing all parts of the flower and one of a flowering plant together with a detailed legend.

These drawings bring to life some of the most extraordinary species of *Bulbophyllum,* particularly those in the section *Lepanthanthe,* five of these are shown in the colour plates. The colour plates are of a very high standard.

This is a book every serious student of orchidology should own and every lover of this fascinating genus of orchids will spend hours of pleasure as he travels through this book of intriguing real life phantasmagoria. ⁂

AUSTRALIAN NATIVE ORCHIDS HYBRID REGISTRATIONS

(New registrations from lists in *The Orchid Review,* May to October, 1993)

Name	Parentage	Registered by
Dendrobium		
Alkina	Karani X Hilda Poxon	R. E. Harris
Bert Bushell	Aussie Spice X X*gracillimum*	S. Batchelor
Beverly Anne	*rigidum* X *cucumerinum*	G. R. Young
Careel	Delicate King X Bardo Rose	S. Batchelor
Easter Parade	Mini Pearl X Specio-kingianum	T. Nakajima
Gai Ellen	Ellen X Ku-Ring-Gai	W. Skillicorn (K. Russell)
Illiam Dhone	Rosy Tips X *bigibbum*	W. Higgins (O/U)
Ivory Moon	Jombock X Essie Banks	W. T. Upton
Ken Roberts	Lynette Banks X Specio-kingianum	S. Batchelor
Montaken	*bigibbum* X Merritt Island	T. Vajrabhaya
Pink Harmony	Jombock X Goblin	W. T. Upton
Rosehill	Rosella X Hilda Poxon	W. T. Upton
Rosy Spectre	David Baver X Bright Spark	W. T. Upton
Rutherford Blushing Bride	Gillian Leaney X Zip	T. J. Smith
Rutherford Golden Sun	Hilda Poxon X Zip	T. J. Smith
Rutherford Kingray	*kingianum* X Rutherford Supreme	T. J. Smith
Rutherford Mac	Yondi X Rutherford Supreme	T. J. Smith (J. Macmillan)
Rutherford Pink Moon	Rutherford Surprise X *speciosum*	T. J. Smith
Rutherford Sunrise	Zip X Peter Hewitt	T. J. Smith
Rutherford Surellen	Rutherford Surprise X Ellen	T. J. Smith
Stan Harper	Jenni X *speciosum*	S. Batchelor
Star	Aussie Quest X Gai Ellen	W. Skillicorn
Yondi Tina	Nerang x Star of Gold	S. Batchelor
Zucchini	*wassellii* X *cucumerinum*	W. T. Upton
Rhinochilus		
Ritabeth	*Sarcochilus* Melba X *Rhinerrhiza divitiflora*	R. Toombs
Sarcochilus		
Judith	Melba X Fitzhart	W. T. Upton
Rosalie	Mavis X Heidi	A. Duthie

No. 11: *Dendrobium insigne* (Blume) H. G. Reichb. ex Miq.

Common Name:	No common name
Subfamily:	Epidendroideae
Tribe:	Epidendreae
Subtribe:	Dendrobiinae
Genus:	*Dendrobium* Sw.

Distribution: *Dendrobium* is the second largest genus of the Orchidaceae and has an extensive range from India, though southern China, Korea, Japan, South-east Asia, New Guinea, Australia and New Zealand, to the islands of the south Pacific. *Dendrobium insigne* is found throughout lowland New Guinea and the surrounding islands, including those of the Torres Strait.

Notes: *D. insigne* is a large, tall-growing epiphyte that forms large, often straggly clumps. The pseudobulbs are up to 40cm long, narrow (8mm wide) and somewhat flattened throughout. The fleshy, dark green leaves occur along the entire pseudobulb, the larger (7cm x 30mm) being toward the base. Two flowers, generally 25mm to 35mm across, are borne on each raceme from the upper nodes on the pseudobulbs. The colour and size of the flowers are very variable amongst the population of *D. insigne* and the thought has been expressed that there may well be a number of recognisable varieties of this species in New Guinea. Size varies from 20mm to 50mm wide, while colour varies from yellow to orange with red to brown spots and markings. The white lip is highly variable in size and shape; it is often spotted with red-brown in some plants. Although the flowers last only two days, they are produced spasmodically during the year. *D. insigne* prefers tropical, lowland rainforest as its habitat, where it grows on the limbs of trees in a warm to hot, humid environment with high light. However, it can survive in isolated trees in full sun and has been known to tolerate long, hot, dry periods without apparent harm.

Pollination: There is no recorded pollinator of this species.

Conservation Status: This plant is common to abundant in the lowland forests and mangrove areas of New Guinea. The only Australian collection has been from Saibai Island; it has never been collected from mainland Australia. While its native habitat of the lowland rainforests of New Guinea remain relatively unexploited, there is no threat to the survival of the wild populations of this species.

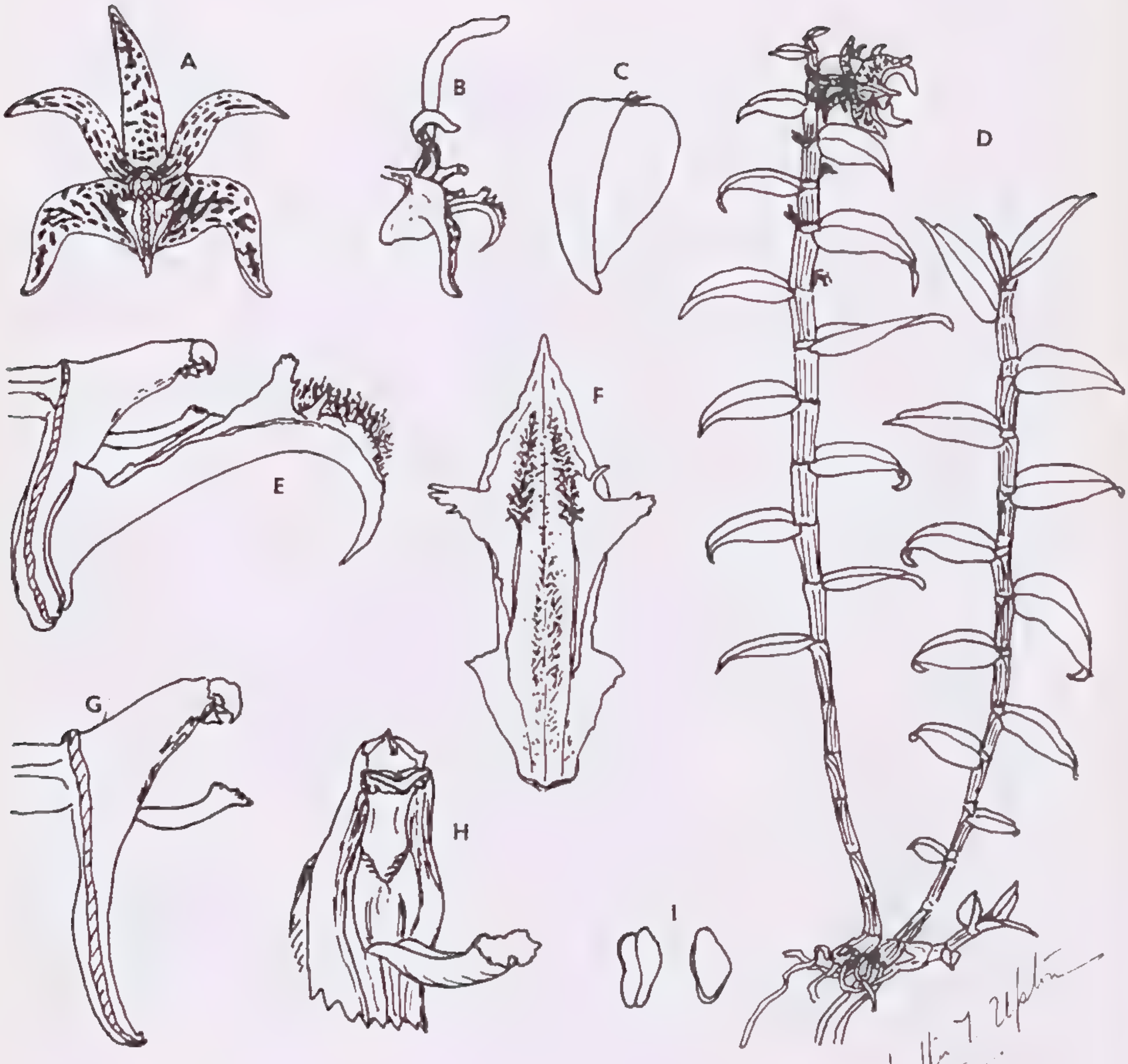
Culture: *D. insigne* is strictly a tropical species, loving hot, humid environments with high light. It can be successfully cultured on a slab or in small pots with very coarse, open compost. Water heavily, daily when in growth and keep just moist for the remainder of the year.

Illustration: The painting illustrates a mature plant of *D. insigne* as seen in its natural habitat.

Description: By Noel Grundon, Toowoomba, Queensland.

Painting: By Mair Swann, Atherton, Queensland.

Line Drawing: By Walter T. Upton, West Gosford, New South Wales.



Walter T. Upton
Nov. '84.

Dendrobium insigne (Blume) H. G. Reichb.

(A) Flower front view 1X; (B) Flower side view 1X; (C) Leaf ⅔X; (D) Plant ⅓X; (E) Column and labellum, side view 3X; (F) Labellum pressed flat 3X; (G) Column side view 4X; (H) Column front showing appendage and large rostellum, anther removed 6X; (I) Pollinia greatly enlarged.

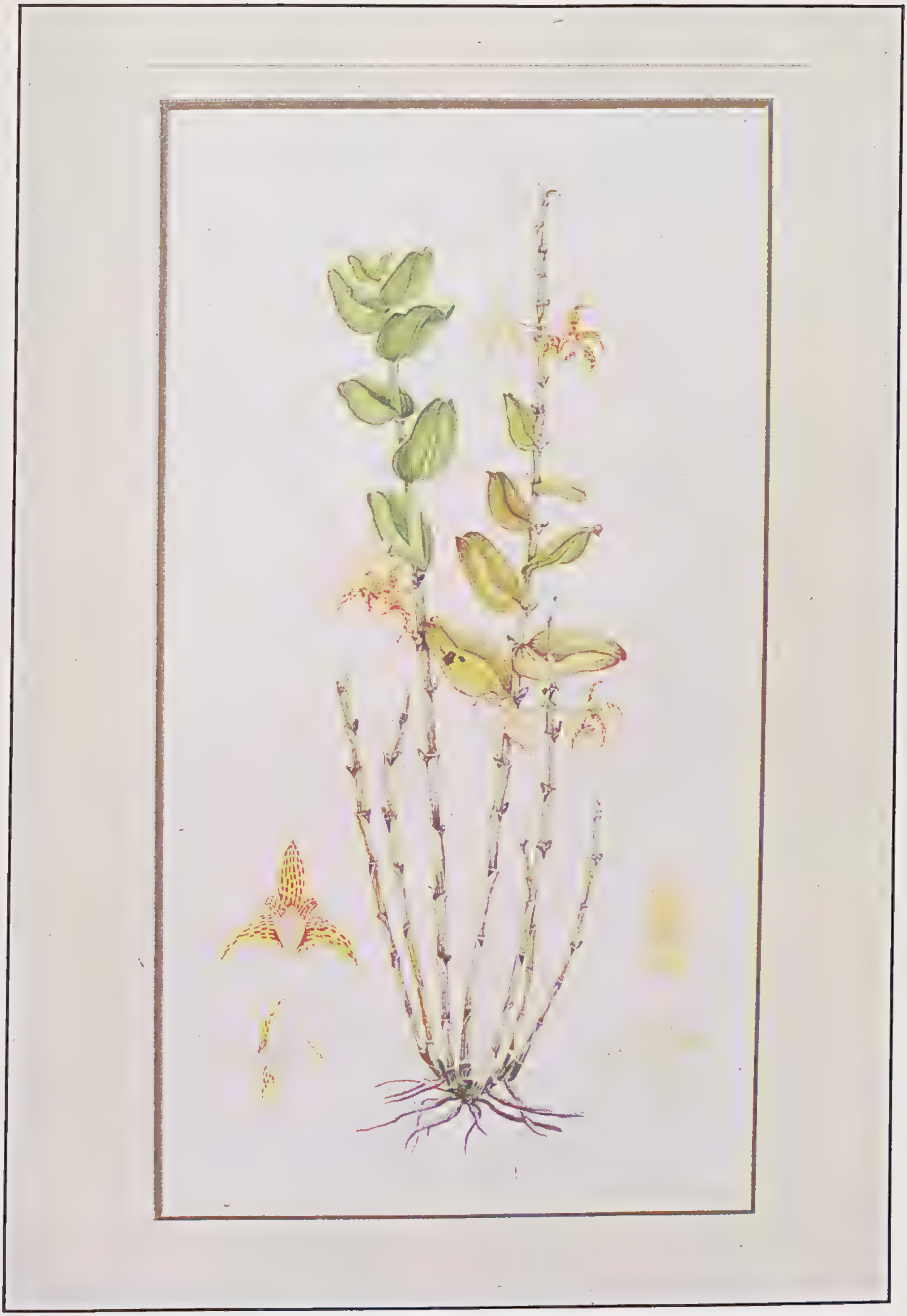


Plate 31: *Dendrobium insigne*. From a painting by Mair Swann.

DUNGOG SHOW REPORT

Darryl Smedley
25B Railway Street,
Baulkham Hills, N.S.W. 2153

Sunday, 23rd May, 1993, saw orchid enthusiasts again gathering at the rustic Dungog Showgrounds for the fourth of the orchid shows promoted by Ken and Noelene Russell of Orchid Glenn Nursery.

The reputation of things good spreads very far very rapidly. What is it about this event that entices growers from as far as Victoria and Queensland to gather for one day? Two things I think (three if you count the top rate barbecue tucker).

First must be to see a selection of the finest native orchid species and hybrids from most of the best growers.

The pavilion is shared between the natives and the exotics. First impressions are important and mine was of the fine array of well grown hybrids backed-up by a bench full of *Dendrobium bigibbum* along the back wall. Orchid Glenn Nursery are justifiably famous for their linebred bigibbums. The Russells must have felt proud that so many of the clones on display were once their babies.

For the second year running Mike Harrison took the championship, this time with *D.* X *leeanum* (Plate 28), a natural hybrid. Reserve Champion was given to *Mediocalcar decoratum,* from New Guinea, it's a cool growing species with curious little "bubble-shaped" orange and yellow flowers and grows very happily and rapidly in my shadehouse.

Amongst the other plants benched were very fine clones of *Dendrobium* Hilda Poxon and a particularly fine array of *D.* Aussie Victory. Some superbly grown section *Spatulata* hybrids were also benched. Of particular merit was *Dendrobium antennatum* X *nindii* beautifully cultivated by Gordon Young from Ballina. I admired a plant of *D.* Regal Affair (Plate 29), a first-flowering seedling I think it was, exhibited by Bede Wilson from the Upper Hunter.

The other "best thing" about the event is, it is a great get-together. Growers come from all over the place to Dungog to meet friends, have a chinwag, talk orchids till the cows come home and tell tall stories. It wouldn't surprise me if they still came if there was only a poor, lonely, scrubby "kingi" on the bench, the friendliness, atmosphere and social occasion is that good.

Just how important this event is as a display and get-together was impressed on me again as I started to take note of the home towns of the winners in the various native classes for this show report — bless you Wally Upton. How's this for a N.S.W. geography lesson — Ballina, Bellingen, Dungog, Gosford, Kyogle, Maitland, Newcastle, Sydney, Taree, Upper Hunter and Wollongong.

To Ken and Noelene Russell and all their willing and efficient helpers I say thank you from all the orchid community for starting and continuing to host such a splendid event. I missed the first and third but will try damned hard not to miss the fifth, sixth, etc. And so should you dear reader. ✻

A.N.O.S. CENTRAL COAST GROUP 13th ANNUAL SPRING SHOW

Bruce Murray
9 Gardenia Close,
Narara, N.S.W. 2250

The Central Coast Group held its 13th Annual Spring Show at the Scout Hall, Gertrude Place, Gosford on the 4th and 5th September, 1993.

The weather on Saturday was mostly fine but cold and public attendance was low. Sunday was fine and warm and consequently attendance was very good.

A total of 276 plants were benched at the Show by 20 exhibitors, including two members of Newcastle Group.

The winners of major prizes were:–

Grand Champion —
Dendrobium speciosum var. *grandiflorum* 'Grand Mal', Neil and Meg Finch

Reserve Champion —
Dendrobium speciosum 'Big Worm', Neil and Meg Finch
Best Specimen Plant —
Dendrobium gracilicaule, John Andrews
Best Species Plant —
Dendrobium speciosum var. *grandiflorum* 'Grand Mal', Neil and Meg Finch
Best Hybrid Plant —
Dendrobium Elegant Heart, Neil and Meg Finch (Plate 38)
Best Species Seedling —
Dendrobium kingianum, Geoff Eager

As Show Marshall, I wish to express my appreciation to all members who worked so dilligently to make the show a success; I would also thank all who exhibited plants.

I offer our special thanks to the A.N.O.S. judging panel — Jim Bailey, Sid Batchelor, Jim Lycos, Ian Slade and Darryl Smedley for its contribution to the success of the show. ✻

A.N.O.S. (Qld.) KABI GROUP SPRING SHOW

John Hazelwood
President, A.N.O.S. Kabi Group

The A.N.O.S. (Qld.) Kabi Groups Second Annual Spring Show was again held at the Chermside Shopping Centre. This year the number of plants on show and the general variety was approximately 30% up on last year's effort, in fact, the display covered the Centre's entire stage area, a truly magnificent sight for the Australasian Native Orchid enthusiast and the general public alike.

Unfortunately the quality, on average, was below that normally exhibited by this fast growing A.N.O.S. group. This was primarily the result of a very early flowering for most of the so called "Better Hybrids" and extremely poor flowering of *Dendrobium speciosum.*

There were, however, some outstanding clones on show, some of these being:–
Parachilus Tigersun — Frank and Bev Simpson
Dendrobium Xruppiosum — George Hellen
Dendrobium canaliculatum with approximately 45 to 50 racemes — Vic Harton

Two unusual natural hybrids were shown by John Mewburn (Troppo John) *D. jonesii* X *D. gracilicaule* and *D. gracilicaule* X *D. adae.*

Our shows are not judged at the present time, but this will possibly take place at future shows, now that we have an A.N.O.S. judging team in Queensland. ✻

A.N.O.S. MACARTHUR & DISTRICT GROUP SPRING SHOW

T. A. Cooke
40 Carrington Circuit
Campbelltown 2560

A.N.O.S. Macarthur and District Group staged its 3rd Annual Spring Show at Casula Mall, Casula on 23rd–25th September, 1993.

Although only a small group of 60 members, the schedule covered 34 classes and 360 plants were benched. A great success.

The awards were eight Champion Trophies and one Junior Encouragement Award (Judges' Choice), plus a sash to each champion.

Grand Champion of Show and **Champion Australian Native** (not terrestrial) won by L. Leilkajis with *Dendrobium canaliculatum* 'Karens Kiss'.

Reserve Champion and **Champion Terrestrial Species or Hybrid** won by J. Riley with *Diuris aurea.*

Champion Seedling won by R. Hanman with *Sarcochilus* Pinky 'Yondi' X *S. hartmannii* 'Kerrii'.

Champion Specimen Orchid won by T. Cooke with *Dendrobium striolatum.*

Champion Australasian Species or Hybrid won by R. Wheeldon with a *Cadetia* species from P.N.G.

Champion Australian Native Hybrid won by R. Bartlett with *Dendrobium Xsuperbiens.*

Junior Encouragement Award won by Master J. Munson with *Dendrobium* Miara.

Prizes in other classes were well distributed among members.

The show was a credit to the 21 members who exhibited, ensuring the success of the show. I would like to thank the Management of Casula Mall for the sponsorship of the show, without them and those who sponsored the trophies, plus the members who manned the show, the show could not have been.

✱

A.N.O.S. PORT HACKING GROUP SPRING SHOW

Neville Roper

Another successful show, assisted by glorious weather. 197 quality plants in bloom and a very motivated group of workers.

Grand Champion was awarded to Steve Deards for his exquisite and very different *Caladenia discoidea* (Plate 32). This plant was so impressive that the judges have awarded it an ACC/ANOS (pending), as well as best terrestrial species and best overall species of the show. Steve made a clean sweep in the "spud" department with *Diuris corymbosa, Pterostylis* Xingens and *P. erythroconcha* also notching up firsts for him.

The best hybrid and Ira Butler nomination was awarded to *Dendrobium* Yondi Pioneer (Plate 33) exhibited by George Barrett — the second show in a row we have been rolled by a novice! George also exhibited a very attractive *D.* Peter X *D.* Peewee to win the Phalaenanthe parentage class.

The Wood siblings dominated the junior sections with Grant's *D.* Lynette Banks being judged the best hybrid and best (overall) junior exhibit. Older brother Greg won the best species with his *D. kingianum* 106 No. 3.

Two multi racemed plants of *D. speciosum* 'National White' did the trick for Col Brandon in the "Rock Lily" class. As is usual, for Col, he picked a swag of prizes; *D.* Peter 'Ira' (an Ira Butler original) in the yellow/green class, *D.* Warooa in the any other colour class, *Sarcochilus* Elizabeth 'Spots' in the *Sarcochilus* Hybrid class and *S. hartmannii* in the *Sarcochilus* species class.

Peter Dowling and Bob Napier formed a deadly duo in the novice species section. In this hotly contested section Peter won with a large pot of *Dendrobium falcorostrum* while Bob's *D. kingianum* came second.

A very promising plant of *D.* Gillian Leaney X *D.* Zip won the seedling class for Dennis Wood. Dennis had to get out the daggers to win the Rhizobium species section with *D. pugioniforme* and the Rhizobium hybrid section with *D.* Jiggi X *D. pugioniforme*.

Some other plants of note were *D.* Hilda Poxon 'Golden Bunch' (best specimen), *D. kingianum* '106 NR' (best kingianum) and a very large plant of *D. gracilicaule* (best dendrobium species). Probably the cutest flowers of the show belonged to Bruce Smith's *Sarcochilus weinthalii.*

Overall a very successful day was made better by the weather.

✱

THE A.N.O.S. SYDNEY GROUP INC. 1993 SPRING SHOW

Michael Harrison, President
A.N.O.S. Sydney Group Inc.

A.N.O.S. Sydney Group Inc. held its 11th Annual Spring Show on 11th and 12th September, at Baulkham Hills Community Centre. To avoid clashing with the Toowoomba Conference, we brought the show forward a week. Early on, this caused us some concern, as we feared we might be a little early for peak flowering, but we needn't have worried. A midler than usual August brought on flowering to perfection and the hall was full.

This season turned out to be a pretty good one for *Dendrobium speciosum* and after the disappointment of 1992, it was great to see such a fine display of this most showy and popular species. Like most things, when you look closely at *D. speciosum* you find no two clones exactly alike and the range in colour, size, shape and inflorescence habit was clearly apparent in the twenty odd plants on show. There was the usual talk about how certain clones change colour from year to year, or how they very in size from one year to the next.

The display of *D. kingianum* was, I thought, not as good as I have seen in previous years. However, it should be noted that Eric Webeck brought in a magnificent specimen plant of his *D. kingianum* 'Bungan Castle' AM/NSW (Plate 35). Eric told me he has been growing this particular specimen, which was well over a metre in diameter, undisturbed in its pot since 1975. A fabulous sight in full bloom and well worth the price of admission alone. This plant easily won Champion Specimen Plant, The Don Barnham Perpetual Trophy and was also rewarded with an ANOS Award of Cultural Commendation.

Our annual prize for Best Orange Blossom Orchid was won by Bill Kennewell for his beautifully cultured specimen of *Sarcochilus flacatus* on a hardwood slab. Bill's plant featured two inflorescences of sparkling, pure white, crystalline flowers all displayed to perfection.

The sections for terrestrial orchids were well represented, the caladenias and *Diuris* in particular were excellent. Bill Kennewell's lovely potful of *Caladenia carnea* 'Suzanne' was the pick of them, made even more impressive in the knowledge that Bill had cultivated the complete exhibit from one tuber he acquired eight years ago. This orchid won Champion Native Species of the Show and gained for Bill an Award of Cultural Commendation. Too often we hear the criticism that growers of terrestrial have an advantage because they can simply put together a potful of tubers, grow them on for half a season to flowering and then present them at a show. Bill showed that with skill, persistence and patience a single clone can be multiplied to create a truly lovely specimen.

The hybrids were a mixed bag, with no particular style predominating, although the starry yellow types were well represented. *Dendrobium* Star of Riverdene was again impressive, with seven or eight different plants on the benches and there were also some good *D.* Yondi Pioneer. Ron Findlater's *D.* Elegant Sunset was magnificent, displaying wide open, bronze-yellow flowers, nearly 90mm tall.

Champion Native Hybrid of the Show went to Sid Batchelor's *D.* (*striolatum* X *teretifolium* 'Black Pam') (Plate 34). Grown to perfection in a wooden-slatted hanging basket, this plant cascaded over the side, covering itself with flowers. The flowers were bronze coloured, suffused with a darker tone approaching purple, each set off with a wide ruffled labellum in cream and purplish-red. Of course, the PNG species used to make this hybrid, known loosely as "*D. teretifolium* 'Black Pam' ", is not an Australian orchid and is most certainly not *D. teretifolium* as we know it at all. Nevertheless, it was a marvellous orchid well worth a place in any collection.

The Patron of A.N.O.S. Sydney Group Inc, Sid Batchelor, introduced a Patron's Prize, to be presented in its inaugural year to Best Hybrid Seedling First Flowering. There was just one hitch — Sid himself was the winner of that seciton. So when it came time for him the make the presentation, he called out our official photographer, David Titmuss. David has worked for many years on behalf of the Group, not only as photographer but also as Membership Officer, so Sid decided it was time to recongise his contributions. No one was more surprised than David when he was called forward and Sid gave his reasons for presenting the prizemoney to David. It was a fine gesture and David really appreciated it.

All things considered, we had another very successful show. Public attendance was up and if the results of the sales table are anything to go by, there must surely be a lot of potential native orchid society members out there looking for some guidance in native orchid culture. ✾

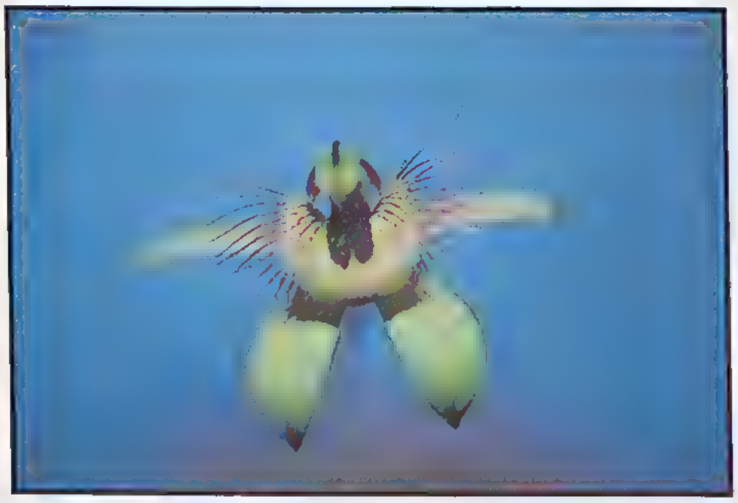


Plate 32: *Caladenia discoidea.* Photo: D. Wood

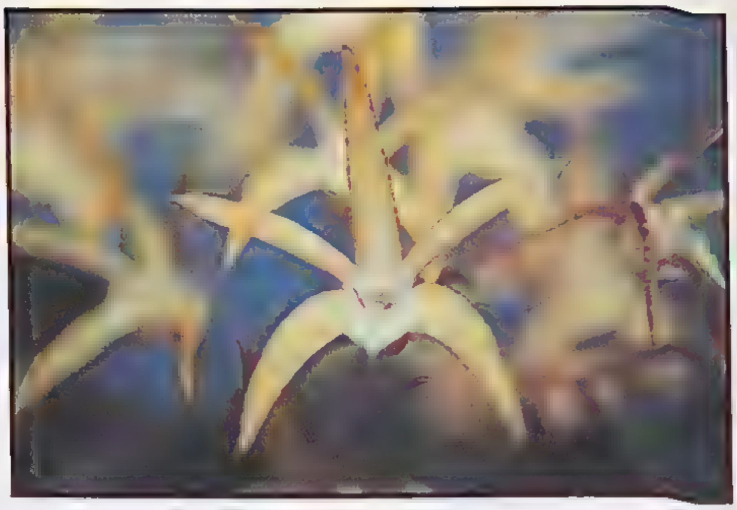


Plate 33: *Dendrobium* Yondi Pioneer. Photo: D. Wood

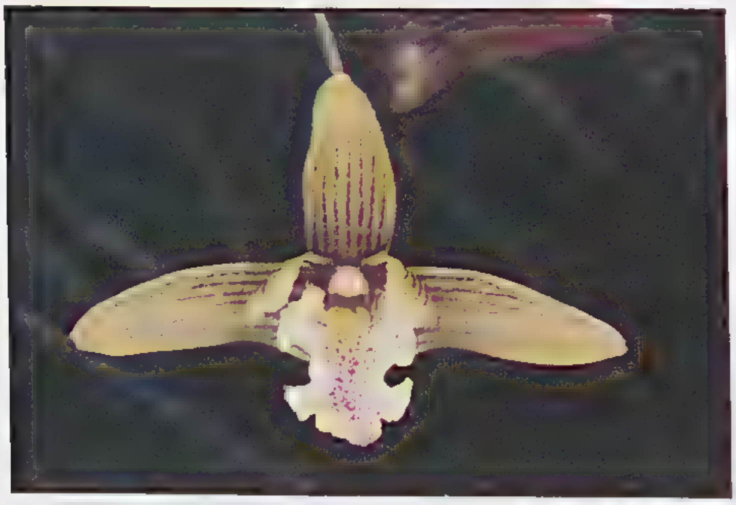


Plate 34: *Dendrobium striolatum* X *D. teretifolium* 'Black Pam'. Photo: D. Titmuss

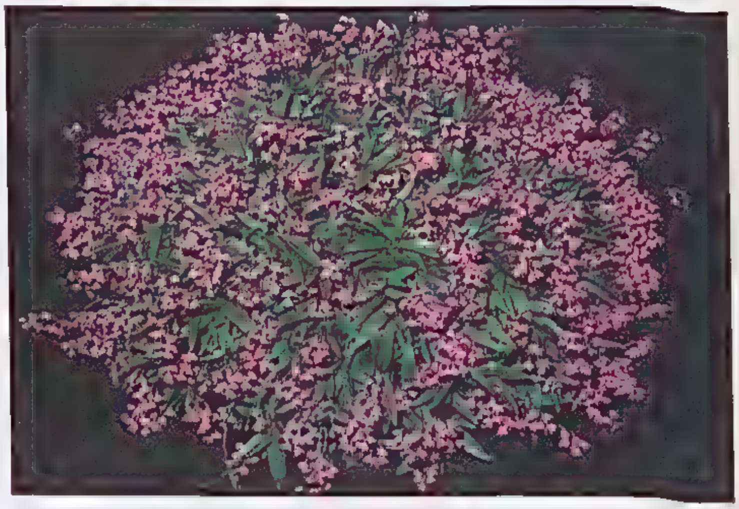


Plate 35: *Dendrobium kingianum* 'Bungan Castle'. Photo: D. Titmuss

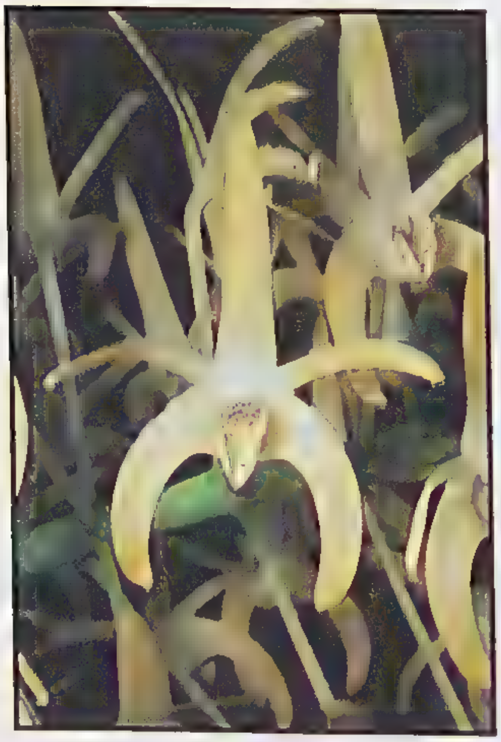


Plate 36: *Dendrobium speciosum* 'Watellow'. Photo: D. Titmuss

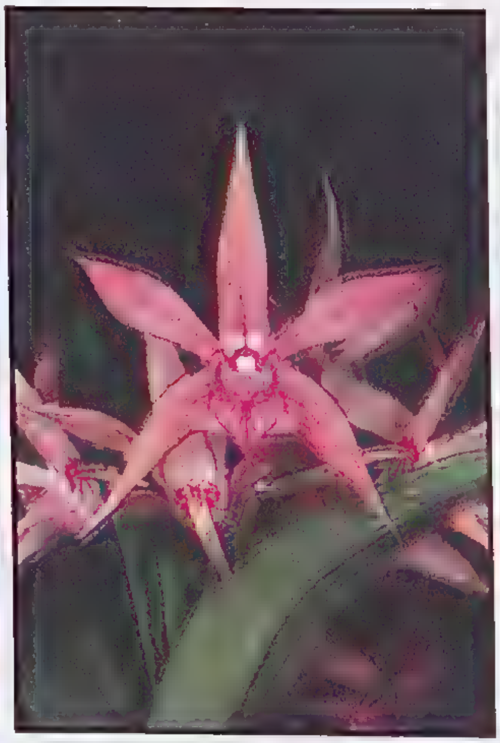


Plate 37: *Dendrobium* Brinawa Sunset 'Supernova'. Photo: D. Titmuss

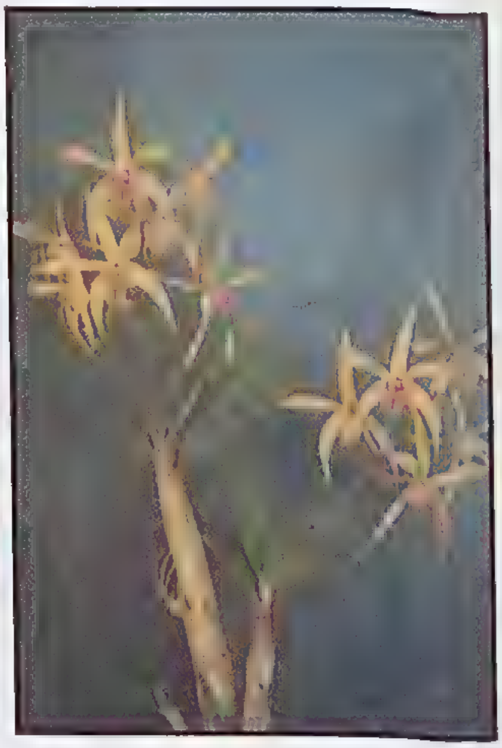


Plate 38: *Dendrobium* Elegant Heart. Photo: J. Turner

A.N.O.S. WARRINGAH GROUP'S SPRING SHOW 1993

Ruth Rudkin
18 Lyle Avenue,
Lindfield, N.S.W. 2070

On September 4, on a cold, blustery but sunny morning Warringah Group's Annual Spring Show opened at the Forestville Memorial Hall. The stage was ablaze with well designed displays, large and small. The benches showed the plants in each section to their best advantage and the sales tables were loaded with good quality plants in flower. Along a wall Chris Barton had hundreds of mounted epiphytes.

The Champion Species and Grand Champion of the show was Neil Finch's *Dendrobium speciosum* 'Watellow' (Plate 36) a mass of good shaped yellow flowers well displayed on long racemes. Neil also won the Champion Australian Native Hybrid with his dusky pink *D.* Brinawa Sunset 'Supernova' (Plate 37). Champion specimen Australian Native Species was A. J. Whitehouse's strikingly coloured *D. kingianum* 'Corrigan's Red'. Chris Arnott's beautifully flowered *D.* Rosemary Jupp in his winning Small Display was once again Champion Specimen Hybrid.

Among other notable section winners was Erik Leilkajis's *Sarcochilus weinthallii* with a raceme of 12 flowers beautifully displayed and Roger Bedford's *Dendrobium* Kim X *D. falcorostrum* which had five racemes of flowers with deep purple tipped tepals and white centres. Bernie Fletcher was first in the Group of three hybrids of which the *D.* Aussie Aurora 'Sunrise' was outstanding. Of interest too were Bernie Fletcher's seedlings, *D.* Warrambool and *D.* Aussie Ira '88' X *D.* Peach Glow 'Brolga' and his Species seedling *D. speciosum* var. *pendunculatum.* Among the terete leaved dendrobiums mention must be made of W. Dobson's *D. pugioniforme* and Frank Holberton's small *D.* Virginia Jupp X *D. striolatum* both firsts in their sections. The most unusual orchid was Mick Korzenowski's *Zeuxine oblonga* with its insignificant self fertilising flowers.

Ron Gallagher and John Roberts won the Large Display with a backdrop of a large mass of *Dendrobium speciosum* and the smaller plants well set out in front. These included *Sarcochilus* Fitzhart 'Zebra' and *S. hartmannii* 'Kerry' and a number of terrestrials, *Glossodia minor, Caladenia catenata* and a *Thelymitra.* Terrestrials were also prominent in three of the other displays, particularly that of Peter Eygelshoven which consisted of perfect potfulls of *Pterostylis* species and hybrids only, including the Champion Terrestrial Species, *P. pedunculata* and Champion Hybrid, *P.* Cutie 'Harold's Pride'. Ray Young's small display was also notable for the number of terrestrials with which he gained three firsts. These included *Diuris punctata, Glossodia major* and *Caladenia catenata* set in a moss covered mound with a bright spot of orange fungus to set it off. In the other large display mostly of epiphytes, Reg Angus had a *Pterostylis* aff. *longifolia* which is not often seen.

Mention should also be made of the part played in our Spring Shows by the yellows and whites of the *Dendrobium speciosum* complex, the red, pink, white and spotted *D. kingianum* species natural or line bred. Of these should be mentioned Mike Harrison's pink *D. kingianum* which was first in the *Dendrocoryne* section, a good red of G. and H. Williams and Neil Finch's seedling *D. kingianum* 'Speckles X 'Freckles'. In the ever popular Classic Hybrids Class, *D.* X *delicatum*, *D.* Hilda Poxon, *D.* Bardo Rose and *D.* Ellen, so many of which grow into specimen plants, had 14 entries, the winner being Chris Arnott's *D.* Rosemary Jupp. Lyn Smith was the successful novice exhibitor in both species and hybrid, while

Barbara Dobson was first in the Junior section with *D.* Double Two X *D. speciosum* 'Ronald Banks' and Kathryn second with a very well-flowered *D. striolatum.*

The show was a credit to the Show Committee led by Chris Arnott and Bob Lowe, the President Jim Bailey, Treasurer Joan Cook, Plant Sales organiser Mick Korzenowski and all the members of the Warringah A.N.O.S. Group who brought plants, set up displays, helped with security, sold plants or raffle tickets. Thanks are also due to those from other Groups who brought their plants from far afield to give us some competition.

SECOND AUSTRALASIAN NATIVE ORCHID CONFERENCE & SHOW — PRIZE WINNERS

(Reprinted from the Journal of the Native Orchid Society of Toowoomba Inc.)

The following is a list of prize winners for the various Champions and Special Prizes awarded at the Second Australasian Native Orchid Conference and Show. A complete list of all prize winners will be forwarded to all Societies for their information in due course. Congratulations are extended to all winners and exhibitors.

SPECIAL PRIZES

Grand Champion of the Show — R. Findlater *Dendrobium* Star of Riverdene 'Amanda' (Plate 27)

Reserve Champion of the Show — N. Mitchell *Dendrobium* King Wong 'Striker' (Plate 26)

Champion *Dendrobium* Species of the Show — M. Harrison *Dendrobium striolatum*

Champion *Dendrobium* Hybrid of the Show — R. Findlater *Dendrobium* Star of Riverdene 'Amanda'

Champion *Sarcanthinae* Species of the Show — B. and H. Ennor *Sarcochilus falcatus*

Champion Other Epiphytic Species of the Show — K. Skaines *Cymbidium canaliculatum*

Champion Other Epiphytic Hybrid of the Show — F. Simpson *Sarcochilus* Fitzhart

Champion Terrestrial Species of the Show — W. Kenewell *Diuris alba*

Champion Terrestrial Hybrid of the Show — J. Lynch *Diuris longifolia* X *pedunculata*

Champion Specimen Orchid of the Show — C. and B. Wuth *Dendrobium speciosum*

Nomination for the Ira Butler Trophy — R. Findlater *Dendrobium* Star of Riverdene 'Amanda'

Nomination for the Bill Murdoch Trophy — M. Harrison *Dendrobium striolatum*

Warringah Gold Medallion — K. Howath *Dendrobium* Lemon Glow X *D.* Karen Nair

Warringah Silver Medallion — J. Mewburn *Dendrobium tetragonum*

Warringah Bronze Medallion — A. Rosenberg *Diuris corymbosa*

DISPLAYS

Section 1: Minimum 7 square metres, maximum 9 square metres:–

1st Prize — J. and J. Woolf and C. and B. Wuth

Section 2: Minimum 4 square metres, maximum 5 square metres:–

1st Prize — A.N.O.S. Sydney Group
2nd Prize: K. and G. Orchids and Bulbs Nursery
3rd Prize: Toowoomba Orchid Society

Section 3: Table top, 1 square metre

1st Prize: A.N.O.S. Logan Group
2nd Prize: J. and J. Woolf and C. and B. Wuth
3rd Prize: Simpson Orchids

THE 30TH ANNUAL GENERAL MEETING OF A.N.O.S. INC. HELD AT THE GOSFORD R.S.L. CLUB ON 31ST JULY, 1993

R. G. Napier, 12 Laguna Street, Caringbah 2229

A.N.O.S. Central Coast Group hosted the 30th A.G.M. at Gosford, attended by 30 members. Group attendance details are: Central Coast 12, Hawkesbury 1, Macarthur 1, Newcastle 4, Port Hacking 3, Sydney 4, Victoria 1, Warringah 2, plus two from Wollongong and District Native Orchid Society. The Special General Meeting to vote on the motion: "That the Society's rules be amended by deletion of clause 17 (2) (e)" — was held before the A.G.M. and the motion was carried unanimously.

The A.G.M. was declared open by the President, Barry Collins. In his report he mentioned the continued progress of the Society with the formation of three new groups, one each in Western Australia, Queensland and New South Wales, with the possibility of two more in New Zealand in the near future. He thanked all Councillors for their co-operation and support and singled out Wal Upton for his efforts in getting *The Orchadian* back on line.

The Treasurer pointed out improvement financially and stated the need for numerically stronger membership by both an increase in new members and a decrease in dropouts. Our Editor reported on-time production of *The Orchadian* since September, 1992. He expressed disappointment in the response to his need for articles and lack of assistance from some Editorial Associates, but praised Neville Howcroft, Michael Harrison, Peter Adams and Brian Molloy for obtaining or supplying material and thanked Noel Grundon, Tony Slater and Gerry Walsh for their efforts throughout the year. Central Coast Group's assistance in the packing, mailing and proof-reading is greatly appreciated.

Alan Dash presented the Conservation Officer's Report, mentioning some of the projects in which A.N.O.S. has been involved, these include the Proposed Re-zoning at Anglesea, Victoria; The Forest Advisory Panel on Forest Management for Casino and Grafton with John Moye of Far North Coast Group being appointed to the panel; the possible appointment of an A.N.O.S. representative to advise on new regulations regarding the sale of protected plants in N.S.W.; and the Tuberoid Bank is being reviewed by Macarthur Group under the guidance of Richard Hanman.

Judging Report submitted by Secretary Janet Napier on behalf of Ron Wheeldon, Registrar of Judges. A Provisional Queensland Juding Panel has been set up, A.N.O.S. Western Australia are actively interested in the training of native orchid judges. A booklet of A.N.O.S. Judging Standards, rules, etc., is being produced. A new Judging Class in sydney is to commence early in 1994.

The Election of Council for 1993-1994 was conducted by John Simmons.

President – Barry Collins
Vice-President – Michael Harrison
Secretary – no nominations
Treasurer – Bob Napier
Editor – Walter T. Upton
Councillors – Neil Finch
– George Hillman
– Bruce Murray
– Janet Napier
– John Riley
– Rob Trevenar
– John Turner

(at a subsequent Council Meeting, Roma Stirling was appointed to the position of Secretary).

Brief reports were given by Group Representatives present. The meeting closed at approximately midday.

After luncheon the Advisory Committee Meeting was convened. Briefly the proposal to extend the current A.N.O.S. boundaries of "Australasia" to the Wallace Line was discussed. A vote was taken and the motion to extend the boundaries was lost. There was a general discussion regarding the structure of A.N.O.S. A broad recommendation for an Australasian Governing Body was formulated for consideration by Council, prior to presenting it to the A.N.O.S. Groups Meeting in Toowoomba during the Second Australasian Orchid Conference in September.

Our time at Gosford was very pleasant, the venue and facilities there are excellent, a pity more members did not come along to enjoy them, especially those members living in Sydney, it is only 30 minutes from Hornsby and 1 hour 45 minutes from Wollongong.

Thanks to Pat Burns and the people at Central Coast for a most enjoyable day and to John and Yvonne Turner for inviting Council members and others to socialise at their home after the meeting. ✾

AUSTRALASIAN NATIVE ORCHID SOCIETY INC.

Statement of Receipts and Expenditure for year ending 30/6/1993

RECEIPTS	$
Orchadian – Subscriptions	25,940.00
– Colour Fund	1,131.50
– Sales of Back Issues	1,123.00
– Advertising	420.00
Conservation – Donation	230.95
– Badge Sales	2,304.00
1st Conference – Badge Sales	191.00
– Proceedings Sales	179.00
Judging Panel – Donations	375.00
– Award Certificate Fees	160.00
Sales Items – ANOS Medallions	675.00
– ANOS Vic. Culture Book	117.00
– "Endangered Orchids" Poster	5.00
– John Riley Prints	230.00
– ANOS Membership Badge	265.00
– ANOS W.A. Book	24.00
– ANOS Hybrid List	19.50
Bank Interest	336.61
Donations	250.71
Family Member Fees	54.00
Group Member Fees	178.00
Advance Payment for Goods	40.00
Payment for Photocopying	77.00
Postage	73.70
	34,399.97
Unpresented Cheques 1992-93	60.00
Opening Cash in Bank 30-6-1992	12,140.65
	$46,600.62

EXPENDITURE	$
Orchadian – Refund Subscriptions	172.00
– Printing (includes Colour)	17,204.00
– Postage	3,146.07
– Editorial Expenses	488.85
– Registration of "Orchadian"™	260.00
Conservation – Badge Cost	1,950.00
1st Conference – Refund Badge Sale	2.00
– Refund Proceedings Sale	14.00
Judging Panel – Registrar Expenses	483.75
– Cost Award Certificates	375.00
Sales Items – Cost ANOS Medallions	342.50
– Purchase Vic. Culture Books	80.00
– Purchase Orchid Poster	30.00
– Payment J. Riley Prints	230.00
Purchase of Equipment (Heat Sealer)	228.00
Public Liability Insurance	210.41
Rent	420.00
Bank Charges & Credit Card Fees	401.90
Donations	286.00
Refund Family Member Fee	2.00
Incorporation Expenses	20.00
Payment for Goods – J. Creeggan	12.00
Stationery, Photocopying & Phone	633.08
Postage	535.60
	27,527.16
Unpresented Cheques 1991-92	3,850.39
Closing Cash in Bank 30-6-1993	15,223.07
	$46,600.62

We also have $6,593.02 in F.T.D. Account with ANZ

AUSTRALASIAN NATIVE ORCHID SOCIETY INC.

Statement of Assets and Liabilities as at 30/6/1993

ASSETS	$	$
Cash on hand	NIL	
Cash in Bank	15,223.07	
Term Deposits	6,593.02	
		21,816.09
Stock – Books	66.00	
– *Orchadian* Back Copies	1,688.00	
– Badges, various	3,505.35	
– Medallions	382.50	
– 1st Conference Proceedings	864.00	
		6,505.85
Equipment – Heat sealers		388.00
		$28,709.94
LIABILITIES		
Subscriptions in advance		13,454.00
Advance payment for goods		40.00
Unpresented Cheques		60.00
		$13,554.00

The Australasian Native Orchid Society Inc., offers YOU . . .

BADGES

A.N.O.S. Membership badge (*Dendrobium kingianum*)	$5.00 ea.
1993 Conservation badge (*Thelymitra ixioides*)	$5.00 ea.
1991 Conservation badge (*Thelymitra epipactoides*)	$5.00 ea.
1990 Conservation badge (Dendrobium bigibbum)	$5.00 ea.
1st A.N.O.S. Conference badge (*Pterostylis gibbosa*)	$3.00 ea.
2nd A.N.O.S. Conference badge (*Sarcochilus hartmannii*)	$5.00 ea.

Various A.N.O.S. Groups badges available, contact Treasurer (02) 524-9996

Plus postage and handling:–

1 badge	$1.00
2 to 3 badges	$1.80
4 badges	$2.00

* * * * * *

The following prices include postage and handling . . .

BOOKS

Checklist of Aust. Native Orchid Hybrids, 5th Edition 1993	$8.00
Proceedings of 1st Australasian Native Orchid Conference (Australia)	$17.00
(Overseas)	$20.00
Proceedings of 2nd Australasian Native Orchid Conference (Australia & Overseas)	$34.00
Cultivation of Australian Native Orchids – 2nd Edition, A.N.O.S. Victorian Group	$12.00
Orchids of Western Australia – Cultivation and Natural History	$6.00 each

The Orchadian – Back numbers

Volume 8 – complete	$36.00
Volume 9 – complete	$36.00
Volume 10 – complete	$72.00

Some numbers of Vol. 8, 9 and 10 are available – Vol. 8 & 9: $3.00; Vol. 10: $6.00 per issue.

* * * * * *

DRAWINGS

Superb watercolour prints of J. J. Riley's drawings of Australian native orchids are now available.

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Set 2 – *Pterostylis sanguinea, P. depauperata, Acianthus caudatus, Caladenia concinna, Chiloglottis truncata, Dendrobium kingianum, Sarcochilus australis, Dendrobium striolatum*	$15.00

* * * * * *

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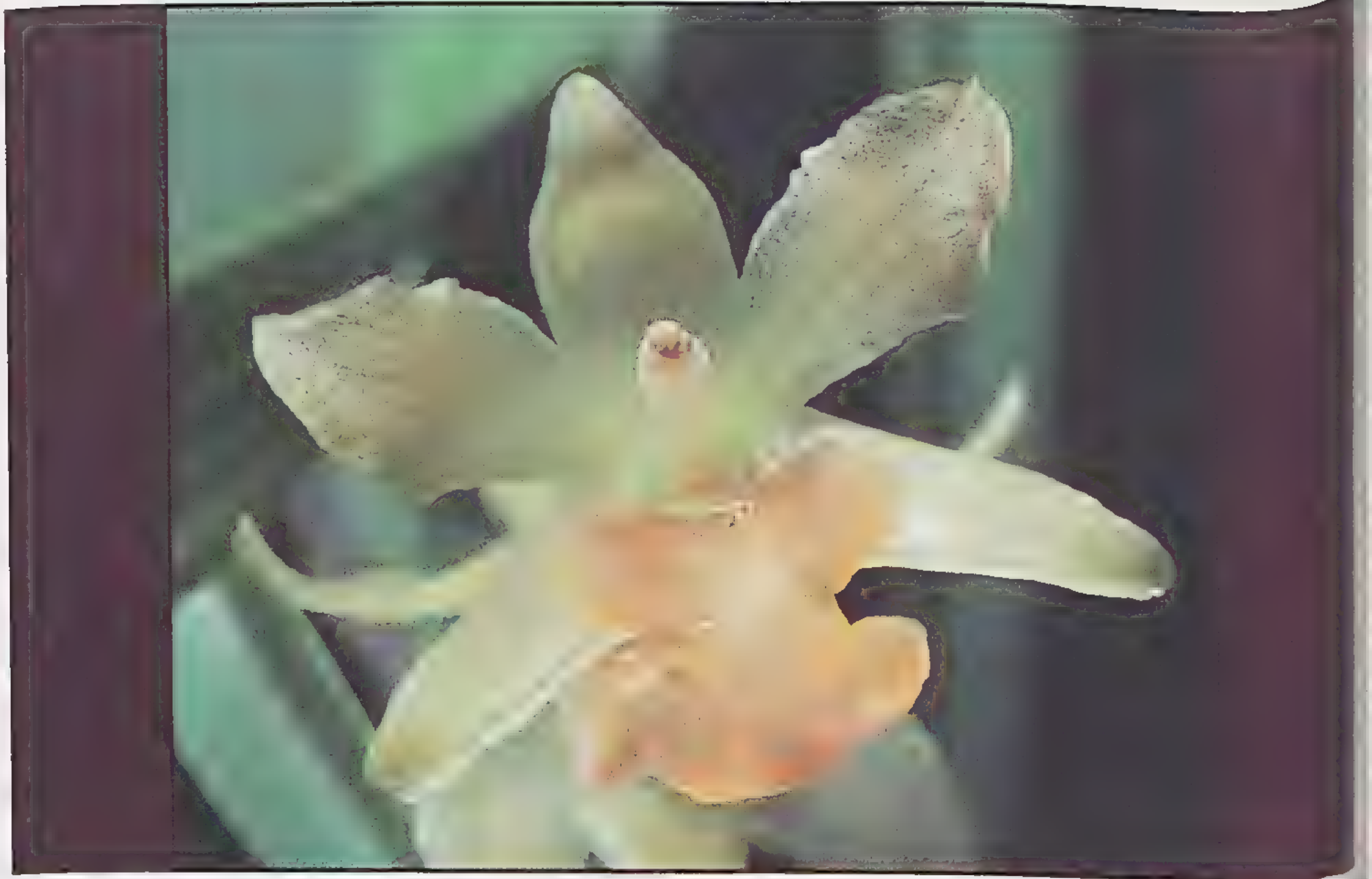

Plate 39: *Earina mucronata.* Photo: D. Titmu

Plate 40: Display by A.N.O.S. of Western Australia.

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The Orchadian

Volume 11, Number 3 March, 1994

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Caladenia deformis,
North East Victoria,
Louise Saunders 26|9|91

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TALKING POINT

A happy, healthy and prosperous 1994 to all our readers. 1993 saw all four issues of our journal on time and each one of 48 pages. Three issues had eight pages of colour and the fourth nine pages. The content, in my opinion, was most interesting. If it lacked in any particular subject then it could have been insuffícent cultural articles. Our botanists and scientists are our best subscribers, this we appreciate, we know they are very busy people. We really need articles on culture by our ordinary members, there are so many members who attend local group meetings and go to great length to give information on how they grow their plants. How about putting pen to paper and seeing it in print for a wider audience to enjoy. Your knowledge is valuable.

How about boasting a bit and send details on that very special hybrid you have just flowered. It is hard to believe that the Ira Butler Trophy for 1993, went to an hybrid first registered by Jupp in 1981. Surely we are not standing still in this important area. What do you think?

Make this your journal, let us know your opinions, if necessary criticise us, do not just tell us what you want in your journal, give it to us. Become an Orchadian author.

Walter T. Upton

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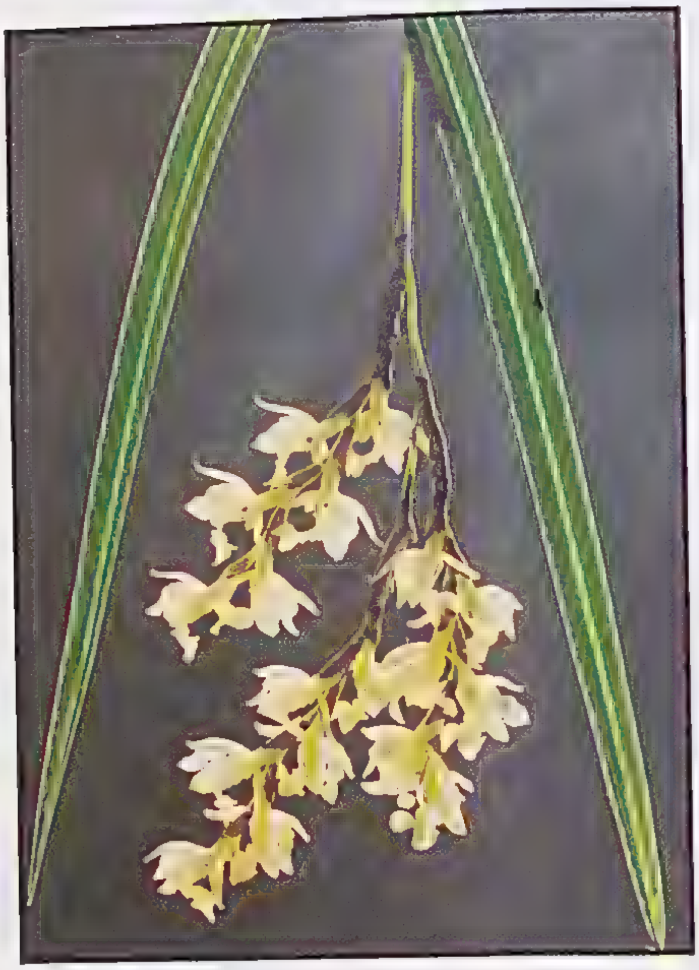
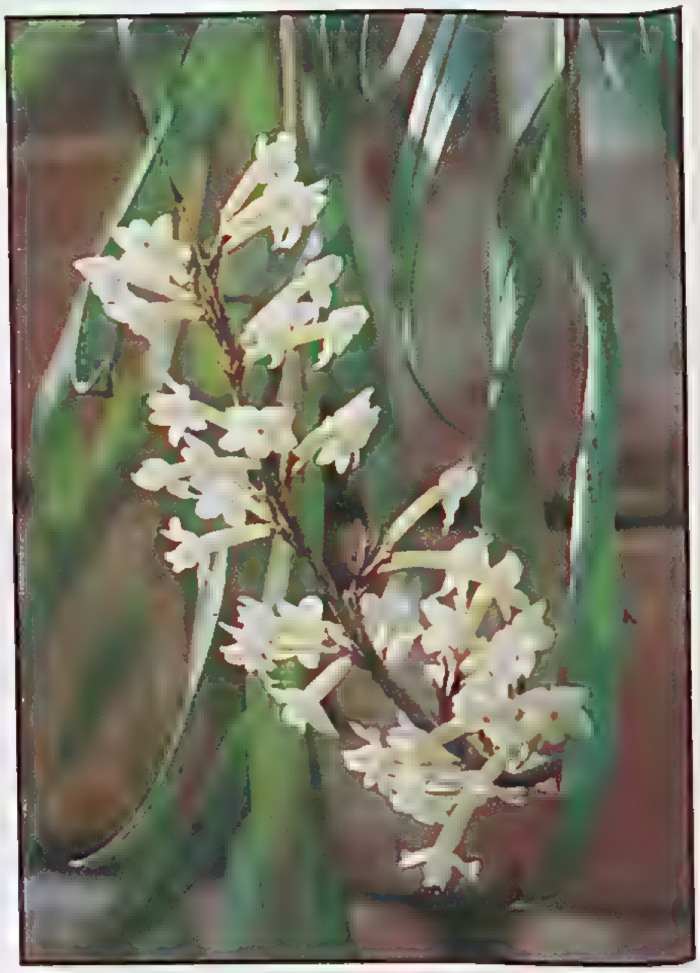
CORRIGENDUM

The Editor's apologies are due to Dr Ian St George for the incorrect placing of the photos in his fine article on the genus *Earina* in the last issue of *The Orchadian* — Plate 3 is *Earina autumnalis* and Plate 4 is *Earina mucronata* and not as shown in Volume 11, Number 2.

These photos are now printed again in this issue with the correct caption underneath.



Earina mucronata. Photo: Ian St George.



Earina autumnalis. Photo: Ian St George.

BUSHHOUSE HYGIENE

Noel J. Grundon
4 Jean Street, Toowoomba, Queensland 4350

Abstract: Control of fungal and bacterial diseases is an important part of good orchid culture. While application of fungicides and bactericides play an important role in the control of disease organisms, many other aspects of everyday culture can decrease the likelihood of disease organisms gaining a foothold in the collection. The stages of disease development are discussed and cultural methods of decreasing the spread of disease organisms are presented.

INTRODUCTION

Orchids suffering from attack by fungal or bacterial disease organisms are unlikely to produce their best. As a result, "What do I spray on the plant to kill the fungus?" is often the first question asked by many hobbyists when diseases are mentioned. Such a question suggests that many people believe that diseases can be controlled only by applying fungicides or bactericides. However, there are many actions, other than the application of fungicides or bactericides, that can be taken to decrease the spread of disease orgamisms in the bushhouse.

It is often said that a healthy plant is better able to resist attacks by fungal and bacterial disease organisms. Hence, we need to provide firstly for the **health** of the plant by supplying the correct cultural conditions. When the right physical conditions for the growth of the plant have been provided, we need to think about its day to day care and the ways we can prevent or delay the onset of diseases. Thus, the second thing we need to think about is the **hygiene** of the bushhouse.

PREVENTING DISEASE BY HYGIENE IN THE BUSHHOUSE

Development of a fungal disease occurs in three stages:–

(a) inoculation
(b) penetration, and
(c) infection.

It is important to understand that a plant cannot become infected by a fungus unless that fungus is firstly present in the environment of the plant. The fungus is usually spread through the environment as spores that are small, thick walled structures that are very resistant to drought and high and low temperatures. These spores are carried to the orchid by wind, water or animals. Once on the surface of the orchid leaf or root, it must germinate and produce a mycelium that needs to gain entry into the plant before the fungus can cause the disease.

Germination of many fungal spores usually requires that free water be present on the leaf or root for some hours. After germination, the fungus must penetrate the leaf or root if it is to kill the plant. Penetration can be either directly through the wall of the outer cells (the epidermis), or through natural openings such as stomata, or through wounds such as those caused during repotting. In most orchid genera, stomata occur only on the lower surface of the leaf, thereby limiting the point of entry of many fungi to the undersurface of the leaf. Plants with thick or heavy leaves such as those belonging to the *Dendrobium* and *Cymbidium* genera and the *Vanda* alliances, have a further protection against direct entry into the orchid leaf. This protection is provided by very thick walled cells immediately below the epidermal or surface cells on both surfaces of the leaf. Fungi may be unable to penetrate through these thick-walled cells.

Once inside the plant, however, the fungus kills the cells of the orchid to gain the nutrients it needs to complete its life cycle. It is during this final stage that the disease becomes evident as dead or dying leaves, roots or stems.

PREVENTING INOCULATION BY SANITATION

Fungal diseases can be controlled by attacking the fungus during any of the three stages of development of the disease. If the spores are not present, the orchid will not become diseased. Hence, the first step in all disease control programs is to limit the number of fungal spores present in the environment of the orchid. Good sanitation management of the bushhouse is essential.

Good housekeeping and cultural habits prevent the build-up of spores; remove all dying or dead leaves or plants and burn them. Cut off all diseased tissues and seal the cut surfaces with a fungicide paste or bitumastic compound to prevent entry of the fungus.

Fungal spores can be spread by wind and water, on tools and animals, including you, the owner. They are transferred on your hands, your clothing and on the cutting tools you use during repotting. Decrease the spread of spores by washing your hands after handling diseased plants and by sterilising cutting tools with sodium hypochlorite (e.g., household bleach), trisodium ortho-phosphate, or by heating them in a flame to near red heat.

PREVENTING INOCULATION BY GOOD CULTURAL HABITS

Good cultural habits prevent the spread of fungal spores. Water can drip from one pot into another and carry disease organisms with it. Good air movement can dry the leaves quickly and so prevent the spores germinating. Overwatering or poorly drained potting mixes can cause water-logging of the roots that promotes infection of the roots by soil borne fungi. Remember that healthy plants are in a better position to repel the attacks of disease organisms and a healthy plant requires good cultural conditions and the correct environment to continue to grow well.

PREVENTING PENETRATION BY PROTECTIVE SPRAYS

Once the fungal spore has germinated, the developing hyphae are easier to kill with the appropriate chemical fungicide. Spores which germinate on the leaves or stems can be killed by applying a protective spray to the leaves and stems **BEFORE** there is any evidence of attack by the fungus. The fungicide forms a protective layer over the plant and must be applied regularly to cover any new leaves produced since the last spray and because the fungicide is washed off with each rainfall or watering. Because fungi gain entry mainly through stomata that occur on the undersurface of the leaf, it is very important that **BOTH SURFACES** of the leaf are covered with the fungicide.

The use of protective sprays is often referred to as using preventive sprays. Dithane®, Maneb®, Mancozeb® and Bordeaux mixture are examples of protective sprays that can be applied to leaves and stems of orchids. It is a good practice whenever possible, to alternate between fungicides to help prevent the development of fungi that are tolerant to a certain chemical.

Fungal diseases which gain entry through the roots can be controlled by drenching the compost with the appropriate fungicide. Fongarid®, Ridomil®, Terrazole®, Aliette® and Previcur® are examples of fungicidal drenches that can be used to control *Pythium* and *Phytophthora* root rots. Terraclor® can be used to control root diseases caused by *Rhizoctonia* and *Sclerotium.*

CONTROLLING DISEASES BY SYSTEMIC SPRAYS

Once the fungus has penetrated into the plant, it is protected from any fungicides applied as preventive or protective sprays to the surface of the leaves and stems. When the symptoms of diseases can be seen, such as dead or dying leaves and stems, it is too late to apply a protective spray; what is needed are systemic fungicides that can penetrate into the plant and be carried to the fungus by the sap of the plant. Benlate® and Rovril® are examples of systemic fungicides that can control many fungi that invade the leaves and stems.

Many popular genera that have thick or heavy leaves such as the *Dendrobium, Vanda* and *Cymbidium* genera, have thick walled cells immediately below the epidermal or surface cells on both surfaces of the leaf. It appears that these thick walled cells not only prevent fungi from penetrating into the leaf, but may also prevent the entry of many systemic fungicides into the leaf. If this fact proves to be general for all systemic fungicides on the thick leafed genera, protective sprays become the only means by which fungal diseases can be controlled on these plants.

SAFETY PRECAUTIONS IN APPLYING FUNGICIDES

Handle all fungicides with extreme care!! Wear protective clothing such as rubber gloves, rubber boots, overalls, glasses and breathing mask while mixing and applying the chemicals. Provide adequate ventilation when spraying inside the glasshouse. Avoid as much direct contact with the chemicals as possible and take a shower after you have finished spraying.

Take care with the plants as well. If you are unsure of the effect the fungicide will have on the orchids, do not experiment with the whole collection; apply the chemical to a few less valuable plants and observe them for a week or so for adverse reactions before applying the fungicide to the remainder of the collection.

Follow the recommendations on the container. Never use higher or lower rates than recommended. Lower rates lead to build up of resistant strains of fungi, while higher rates are costly on the pocket without giving any better control of the disease. Always spray the plants thoroughly, wetting both sides of the leaf.

AUSTRALASIAN ORCHIDS ILLUSTRATED

No. 12: *Pterostylis truncata* Fitz.

Common Names:	Brittle Greenhood, Little Dumpy
Subfamily:	Orchidoideae
Tribe:	Diurideae
Subtribe:	Pterostylidinae
Genus:	*Pterostylis* R. Brown

Distribution: The genus *Pterostylis* is endemic to Australia and New Zealand. *P. truncata* is found in New South Wales and Victoria.

Notes: All *Pterostylis* are terrestrial orchids, but occasionally plants can be found growing on treefern trunks. *P. truncata* is a colony forming orchid, which flowers in early autumn. This species is a cauline species and the flowering plants have leaves on the flowering stem which has one or two flowers. The non-flowering plant produces a rosette of leaves above the ground. The common name of little dumpy originates from the short and stout stature of the flowering plant. The flower is distinctly a *Pterostylis* with the lateral petals and the dorsal sepal partially fused into a hood, known as the galea. The large flower, up to 5cm long, curves forward and ends abruptly and rolls at the tip. This give the galea a truncate appearance, hence its specific name. The galea is distinctly banded with white and green to red stripes. The labellum of *P. truncata* has a counter balance which once tripped by a pollinator, closes the labellum against the galea, directing the pollinator through a tunnel formed by the column wings and past the reproductive organs of the flower.

Pollination: There is no recorded pollinator for this species. A few species of *Pterostylis* are reported to be pollinated by fungus gnats.

Conservation Status: This species is listed as endangered within Victoria where it is limited to a few disjunct areas near Melbourne.

Culture: *Pterostylis truncata* is a colony forming terrestrial. These orchids grow well under 50% shade in a basic terrestrial orchid mix. As this orchid flowers in early autumn, the pot should be watered from early summer to late spring and the plants flower better if kept cool over summer.

Illustration: Painting: Illustrated are two flowering plants and a non flowering plant of *Pterostylis truncata.* The side and rear views of the flower show the galea and the widely diverging tips of the lateral sepals. A non-flowering plant can be seen above the leaf litter. Drawing: There are two views of a flowering plant, from the front and the side. (Figure A) side view of the flower with half the galea and lateral sepals removed showing the labellum against the column. (B) close up of the column and the labellum, note the counter balance at the base of the labellum. (C) front view of the column, showing the column wings curl towards each other and form a tunnel, with the stigma at the base and the rostellum and pollinia at the top. (D) oblique view of the column with one column wing removed showing the pathway of the pollinator, first past the stigma and then the rostellum and anther.

Description: By Tony Slater, 159a Raleigh Street, Thornbury, Victoria 3071.

Illustrations: By Helene Wild, 56 Civic Parade, Seaholme, Victoria 3018.

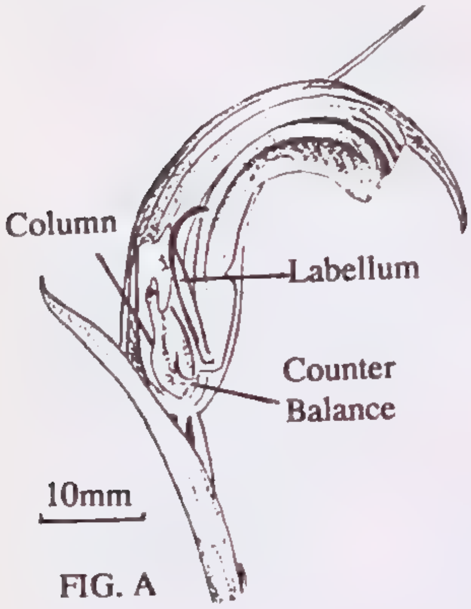


FIG. A

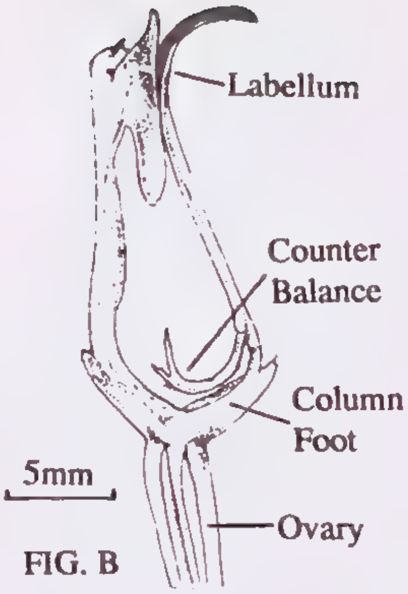


FIG. B

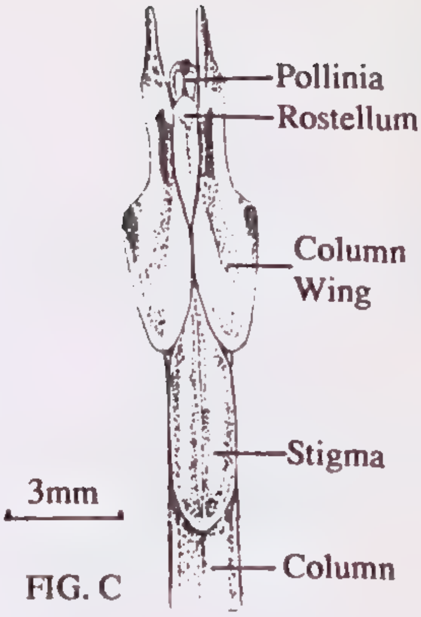
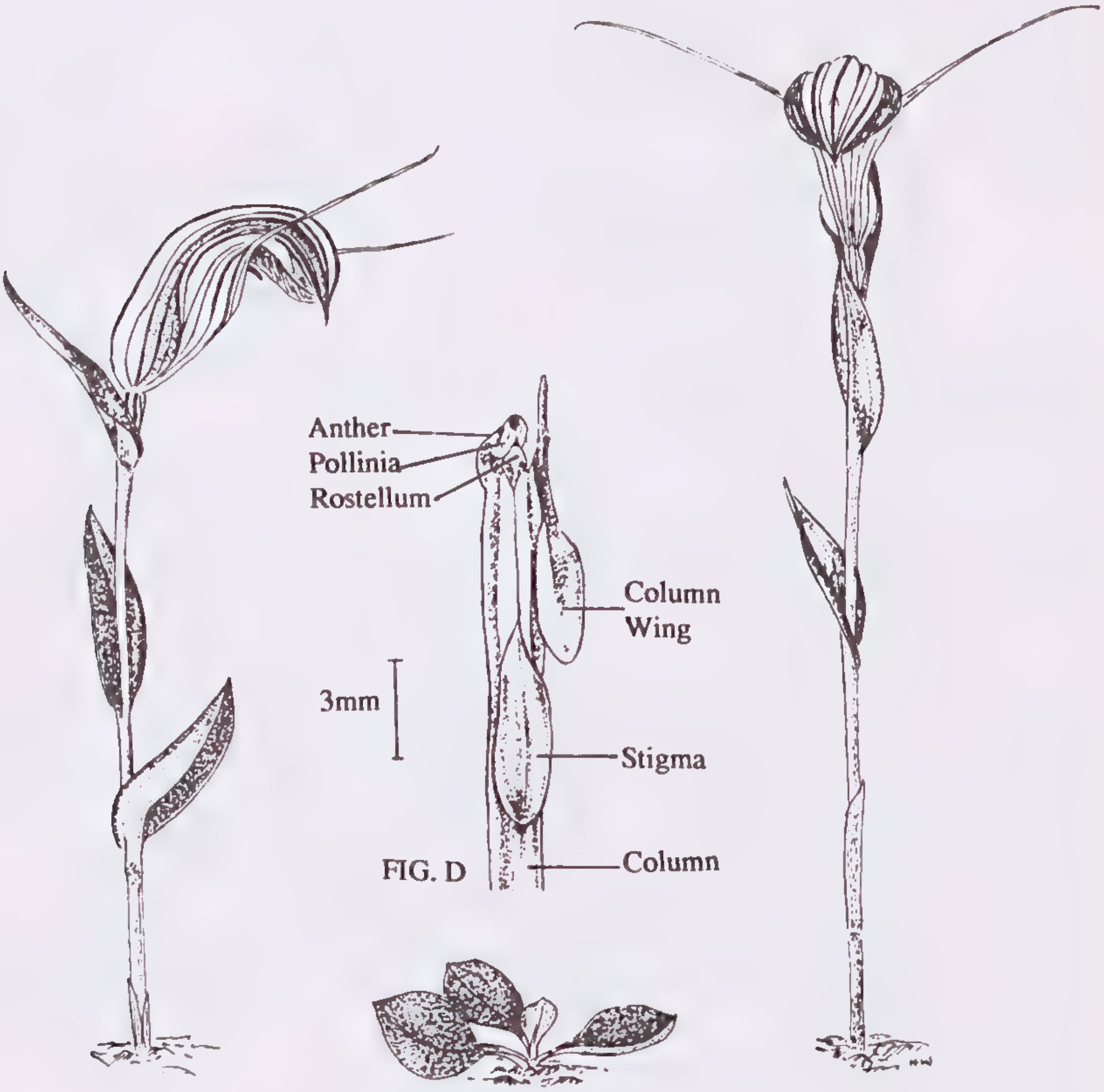


FIG. C



Pterostylis truncata **Fitz.**

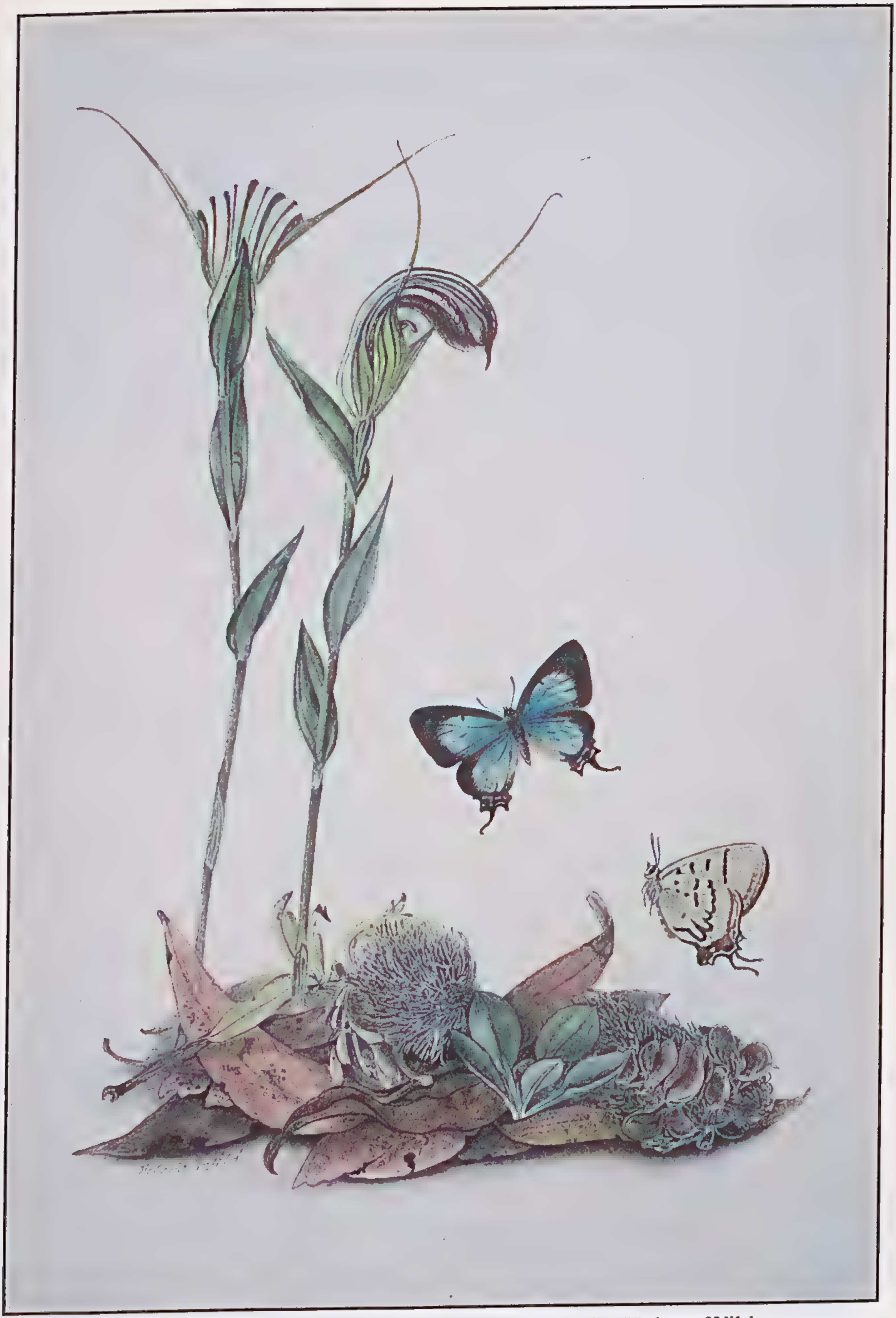


Plate 1: *Pterostylis truncata.* From a painting by Helene Wild.

THE REPRODUCTIVE ECOLOGY OF *DENDROBIUM TORESSAE* (BAILEY) DOCKR., A GEOGRAPHICALLY RESTRICTED SPECIES IN NORTH-EAST QUEENSLAND

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Summary: The reproductive ecology of *Dendrobium toressae* (Bailey) Dockr., a rare Australian epiphytic species, was examined over three years. The flowers are nectarless and attract worker caste *Trigona* Jurine bee pollinators with a colourful display and fragrance. *Trigona carbonaria* Sm. and *T. hockingsi* Cock. are both involved. Experimental pollinations indicate that this species is outbreeding, with a variable but lesser capacity for self-fertility. Insect predators reduced capsule set and about four pollinator visitations per capsule was recorded. Fire destroyed plants and altered the vegetative growth and flowering of individuals by comparison with controls. I speculate that low fecundity may have contributed to and probably helps to maintain, the rarity of *D. toressae* in north-east Queensland. Plans for the preservation of this species should take reproductive ecology into account.

INTRODUCTION

The study of reproductive ecology in Australian species of *Dendrobium* Sw. began largely with the work of Jones and Gray (1976–1977), who described the pollination mechanism and identified the pollinators of two epiphytic species in north-east Queensland. Jones and Gray's work was paralleled in south-eastern Australia by Adams (1988–1991), who concentrated mainly on temperate orchids, describing the breeding system (Adams 1988a), limitations to capsule production (Adams 1989), pollination (Adams 1988b, Adams 1991, Adams and Lawson 1988) and effects of fire on other species (Adams and Lawson 1984). More recent work was done on the pollination of additional species in north-east Queensland (Adams *et al.* 1992, Bartareau 1993a, b).

Dendrobium toressae (Bailey) Dockr., an endemic orchid of the section *Lichenastrum* (Brieger) Dockr. (Dockrill 1992), is found in tall open forest and rainforest between the Bloomfield River and Tully River in north-east Queensland (Dockrill 1992). This species is distributed from the coast to about 2,000m, often growing on boulders or trees in situations which receive plenty of humidity and light. *Dendrobium toressae* is known to occur within a few areas of national park, yet may or may not be adequately conserved within existing reserves. The recommended preservation status is 3RC according to Briggs and Leigh (1988).

The aim of this study was to investigate the reproductive ecology of *D. toressae*. Four questions were asked:–

(1) What is the pollination system?
(2) Is capsule set pollination limited?
(3) Are plants self-compatible?; and
(4) Does fire affect the vegetative growth and flowering of plants?

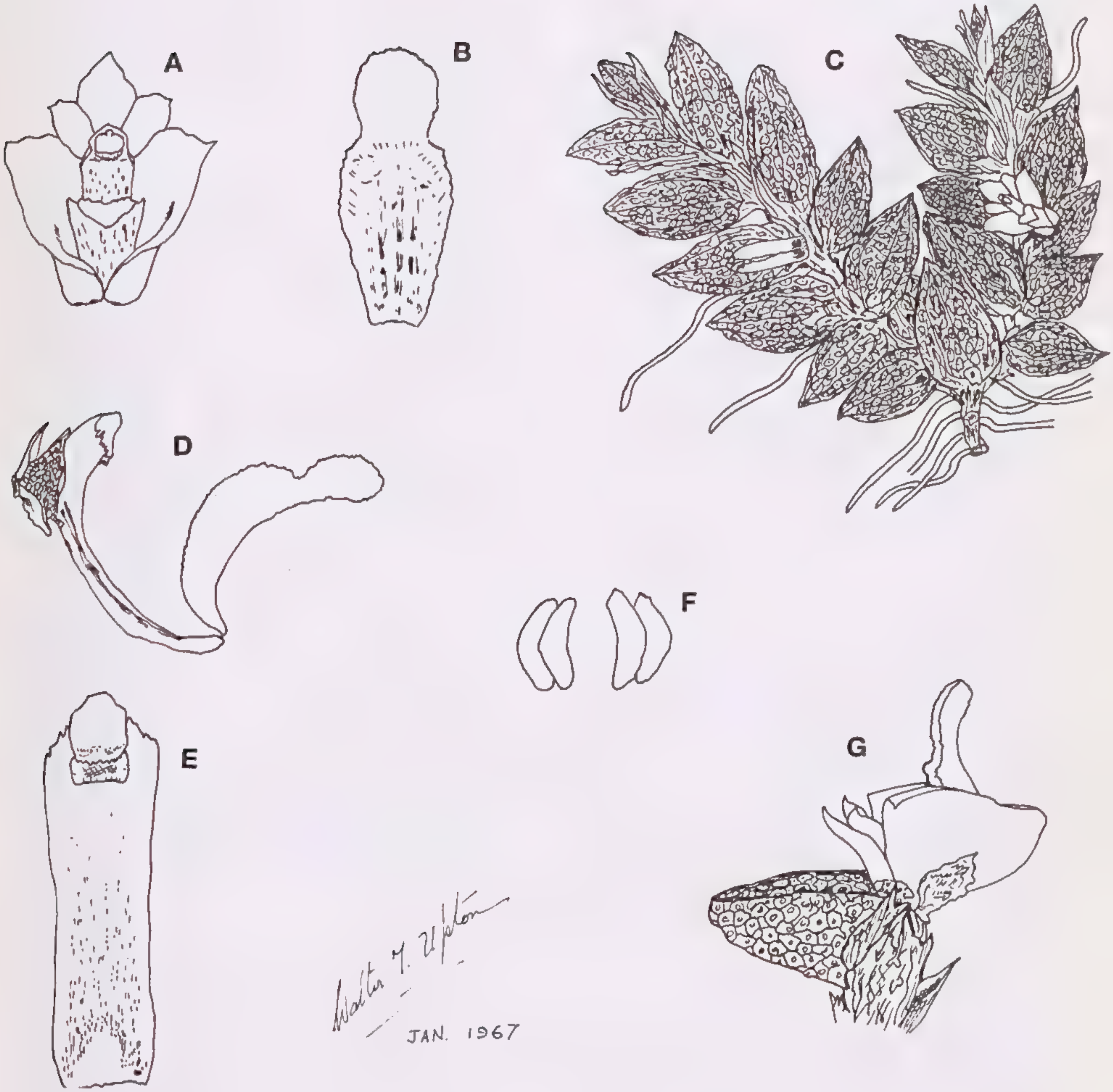
METHODS

I studied a population of *D. toressae* in the Atherton Tableland growing on boulders in tall open forest at three sites:–

(i) junction of Chunnum and Gilbey Creek;
(ii) Spring Creek; and
(iii) Walsh River;

about 10km south-east, 8km south-east and 10km north-west of Herberton (17° 23'S 145° 23'E, 980m), respectively, from January, 1990 to January, 1993. Observations of pollinators were made at different times of the day during most climatic conditions. Pollinators were observed whenever possible, captured with an aspirator, pinned, photographed and samples were sent away for identification.

Since ineffective or infrequent pollinator visits may limit capsule set, I monitored 32 plants at the Walsh River from 1991 to 1992



Dendrobium toressae (Bailey) Dockr.

(A) Flower from front 4X; (B) Labellum from above 6X; (C) Plant 2X; (D) Column and labellum from side 6X; (E) Column from front 8X; (F) Pollinia 15X; (G) Flower and leaf from side 4X.

and recorded the number of flowers with pollinia removed, number of flowers initiating capsules (as evidenced by swelling of the ovary or pollinia on a stigma) and number of dehiscent capsules. Capsule production was assessed just before dehiscence. Plant herbivory and pollinator predation was also recorded.

To examine the breeding system, 12 flowering individuals were collected from boulders and fallen trees at the Barron and Beatrice Rivers. These plants were cultivated on cork and wood slabs in a shadehouse at Herberton and watered regularly. From July, 1991 to March, 1992, all the flowers of plants were experimentally cross–, self– and hybrid–pollinated by hand using fresh pollen, about 5 days after anthesis. Also, 10 plants at Gilbey Creek and 10 at the Walsh River were experimentally pollinated *in situ*. Pollen from varieties of *D. lichenastrum* (F. Muell.) Krzl. emend Dockr. was used in hybrid–pollinations.

The fire season in open forests of north-east Queensland is annual or biennial and commences in July extending into November (Unwin *et al.* 1985). A fire near the Walsh River in November, 1990 burnt an area of forest with boulders supporting 70 *D. toressae* plants which had been recorded on earlier visits. Twenty-two of these plants were classified as exposed to fire as evidenced by leaf scorching (Adams and Lawson 1984) and mortality. The remaining plants were growing in a more protected position and had no visible signs of fire damage. Fire may affect vegetative growth, which in turn, may affect flowering in subsequent years. Plants with new shoots and flowers were recorded.

The relative frequencies of successful experimental capsule production, vegetative growth and flowering were examined with a Chi-square test. All statistical tests of data were performed using STATISTIX, version 3.1 (Analytical Software 1990).

RESULTS

Pollination system

The flowers of *D. toressae* do not offer obvious nectar reward but have a musk-like scent. The fragrance intensifies during the day and no perceptible odour is detected at night. Following the criteria of Adams and Lawson (1988), female worker caste bees of the genus *Trigona* Jurine are confirmed pollinators of *D. toressae. Trigona carbonaria* Sm. and *T. hockingsi* Cock. are both involved. Pollinator activity was confined to between 11.00 a.m. and 4.00 p.m., with a temperature above 22°C. Pollinators were observed when the flowers were fragrant.

Trigona approach the open flowers of this orchid by a hovering behaviour and slowly land on the leaves or flowers. Initially the insects chew and scratch near the mid-lobe, then slowly move into the flower attracted to the base of the column. The insects spend about 5 to 30 minutes in a flower and periodically move backwards and forwards as if looking for edibles at the base of the labellum. The precise angle of the labellum holds the insect firmly against the column as its scutellum protrudes into the sticky stigmatic surface and it struggles to exit the flower. It appears that *Trigona* bees become almost trapped in the small flower once their head reaches close to the base of the column foot. To exit the flower the insects, after several trials, slide to the side of the labellum, arch their body and reverse and wiggle, which then enable them to slide their scutellum out of the stigma and escape the flower. The slight constrictions that originate near the middle of the labellum appear to enable this freedom of movement. The anther pivots on its filament to allow the entire pollinarium to be deposited on the curved edge of the scutellum where stigmatic fluid is smeared. This mechanism places the pollinaria firmly on the scutellum of the insect as it reverses out of a flower (Plate 2 A–D). The pollinarium includes four pollinaria found in two closely appressed pairs, without caudicles or stipes and each pair are equal or nearly so in size and falcato-ovoid shaped when viewed from the side.

After visiting a flower a *Trigona* often remains on the apex of the labellum and wipes itself for about two minutes as if collecting a reward. After visiting a flower a *Trigona* with pollinia attached was observed to fly a short distance and then slowly fly back and visit another flower on the same or different rhizome. The insect slowly enter with the pollinia firmly attached to its scutellum. As it entered the flower the scutellum comes into close contact with the column and the pollinia were placed in the sunken stigmatic cavity, completing the pollination process.

Pollination limitation

No pollinations were recorded without accompanying pollinaria removal. About 72% (N = 120) of 166 open flowers had pollinaria removed and 43% (N = 71) initiated capsules. Only 19% (N = 31) produced capsules. Herbivores destroyed 5% (N = 8) of flowers and 6% (N = 4) of initiated capsules. Approximately 51% (N = 36) of capsules aborted prior to dehiscence. The ratio of flowers with pollinaria removed to capsules indicates about four pollinator visitations per capsule. Twelve plants produced no capsules, 11 one, 7 two and 2 three capsules. These results indicate a progression towards a higher relative contribution to the capsule pool by a few individuals.

There was evidence that insect predators may adversely affect the capsule set of plants. Spiders and assassin-bugs frequently captured *Trigona* on flowers with and without pollinaria attached to their scutellum.

Breeding system

A significant ($P< 0.001$) proportion of the experimental capsule development could be explained by cross-pollinations (Table 1). Only 14.9% of self-pollinations produced capsules. No hybrid pollinations with varieties of *D. lichenastrum* produced capsules. Pollinated flowers senesce within two to four days of pollination and capsule abortion usually occurs within about 30 days. Successful capsules develop over a period of 90 to 100 days.

Table 1: Results of experimental self–, cross– and hybrid–pollinations of all open flowers of *D. toressae* plants.

Treatment	No. of pollinations	No. of capsules (%)
Self–pollination	47	7 (14.9)
Cross–pollination	32	28 (88.0)[a]
Hybrid–pollination	43	0

[a] $x_1^2 = 37.8$, $P< 0.001$.

Effects of fire

From 1990 to 1993, about 73% (N = 16) of plants exposed to fire produced new leaves. Each of 48 plants protected from fire produced new leaves and the differences were significant ($x_1^2 = 11.1$, $P< 0.001$). During this period, 77% (N = 37) of plants protected from fire produced flowers in each year. Only 46% (N = 10) of exposed plants flowered more than once in that period ($x_1^2 = 5.5$, $P = 0.02$). This fire destroyed 23% (N = 16) of plants.

DISCUSSION

The flowers of *D. toressae* are adapted for outcrossing. On entry of a flower a portion of a *Trigona* bees scutellum receives a coating of sticky viscid fluids from the stigma. On reversing out, the protruding part of the scutum hooks the rostrum of the anther which is hinged on the column. During this mechanism pollinaria adhere to the scutellum of the insect visitor. Deposition of pollinia on a stigma is achieved in a similar manner when an insect with pollinaria attached visits another open flower. The processes are facilitated by curve-shaped pollinaria which firmly attach to a pollinator. Moreover, the labellum pivots on its claw and noticeably narrows the gap through which the *Trigona* must pass bringing its scutellum into close contact with the pollinaria and stigma.

In the Atherton Tableland, a fraction of flowers in a population is likely to have received a surplus of self-pollen transfers and aborted capsules due to incompatibility.

Therefore, low capsule set in *D. toressae* perhaps can be explained on the basis that some species of *Dendrobium* appear to favour outcrossing (Adams 1988a 1991, Johansen 1990, Bartareau 1993a). Predation of pollinators and herbivory also lead to reduced capsule set. Low fecundity may have contributed to and probably helps to maintain, the rarity of this species. However, capsule set measures reproductive success only in populations of annual flowering plants without a seed bank. For perennials, capsule set is only one factor of overall reproduction and its relative contribution to fitness may or may not be significant. Information on seedling development is required to evaluate fully the degree to which reproductive fitness is pollination limited.

Of all the environmental factors affecting epiphytic orchids, fire appears to be one of the most influential. There is evidence that the distribution of some species may be associated with fire regime (Cook 1991, Bartareau and Skull, in press). Observations in this study confirmed that plants regenerate from some fire damage and ability demonstrated by *Cymbidium suave, Dendrobium jonesii, D. linguiforme, D. monophyllum* (Bartareau, pers. obs.) and *D. speciosum* (Adams and Lawson 1984). Plants exposed to fire had a greater subsequent decline in vegetative growth and flowering in subsequent years, supporting published hypotheses (Adams and Lawson 1984). Furthermore, fire may destroy seeds and developing seedlings. Fires, previously lit by Aborigines, but now mainly started by graziers, are a regular feature of Australian open forests. Modern fire regimes may contribute to the decreasing number of epiphytic orchid populations growing in these habitats.

As capsule set in *D. toressae* was low, any reduction in pollinator abundance may adversely affect the fecundity of this rare species. Two types of human disturbance are known to be particularly detrimental to bee populations. Firstly, herbicides and pesticides are often harmful to bee populations. Because bees have low fecundity, their populations may not recover for several years following spraying (Johansen 1977). Secondly, *Trigona* usually nest in the hollow-bearing trees (Michener 1961) and fire can destroy nest sites (T. Bartareau, pers. obs.). In light of these factors, plans for preservation of this and other rare orchids should take the biology of associated pollinators into account.

Differences in the capsule set, vegetative growth and flowering among field and experimental plants suggest that fire, predation and breeding system biology influence reproductive fitness of populations. These factors are by no means exhaustive, nor mutually exclusive, but may partially explain the limited distribution of *D. toressae* in north-east Queensland. This information is critical in ascertaining whether the remaining populations can survive in communities subjected to changing land use and tenure.

ACKNOWLEDGEMENTS

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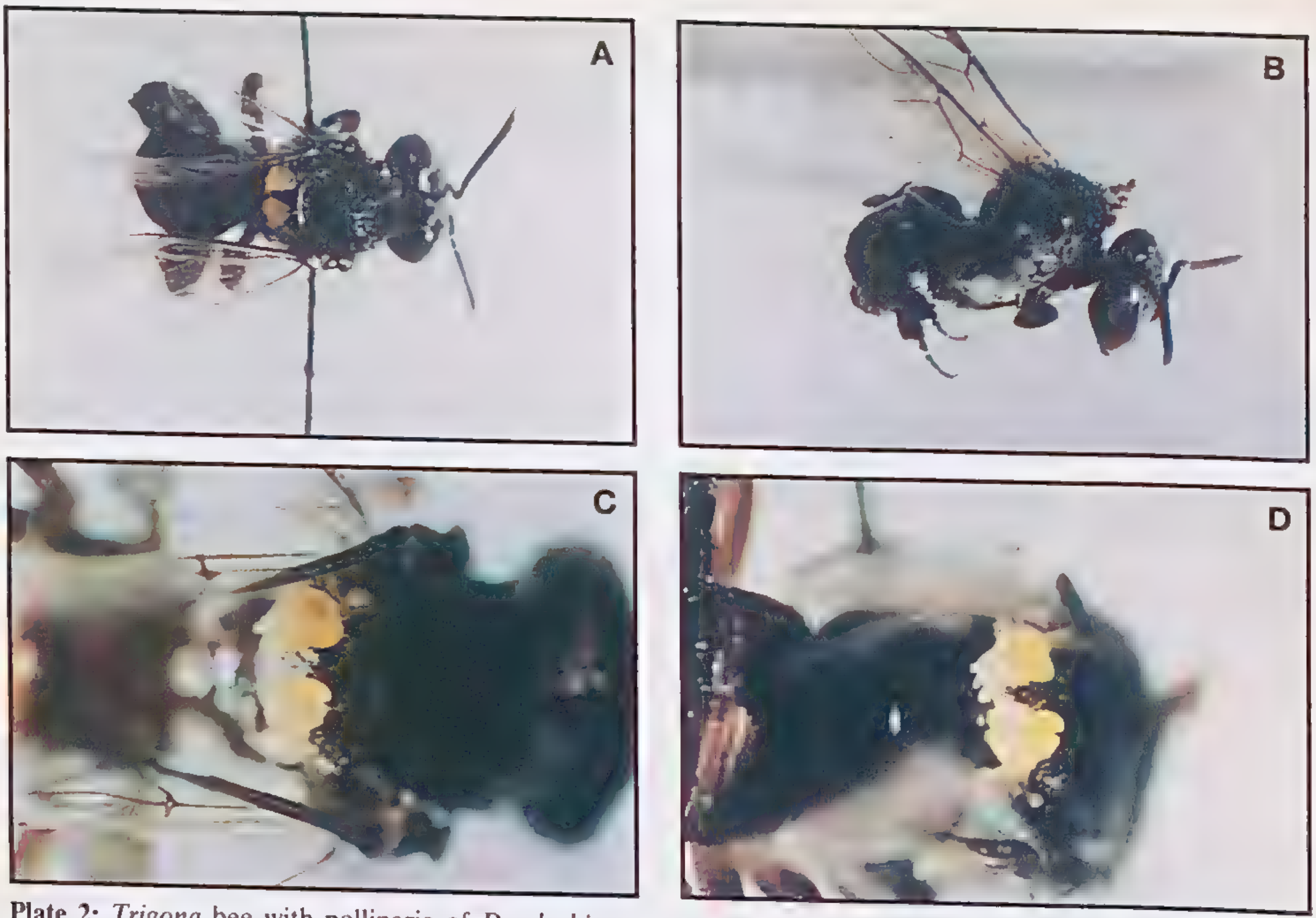

Plate 2: *Trigona* bee with pollinaria of *Dendrobium toressae* attached to its scutum from above (a), side (b), back (c) and close-up from the back (d). Insect is 3.5mm long.

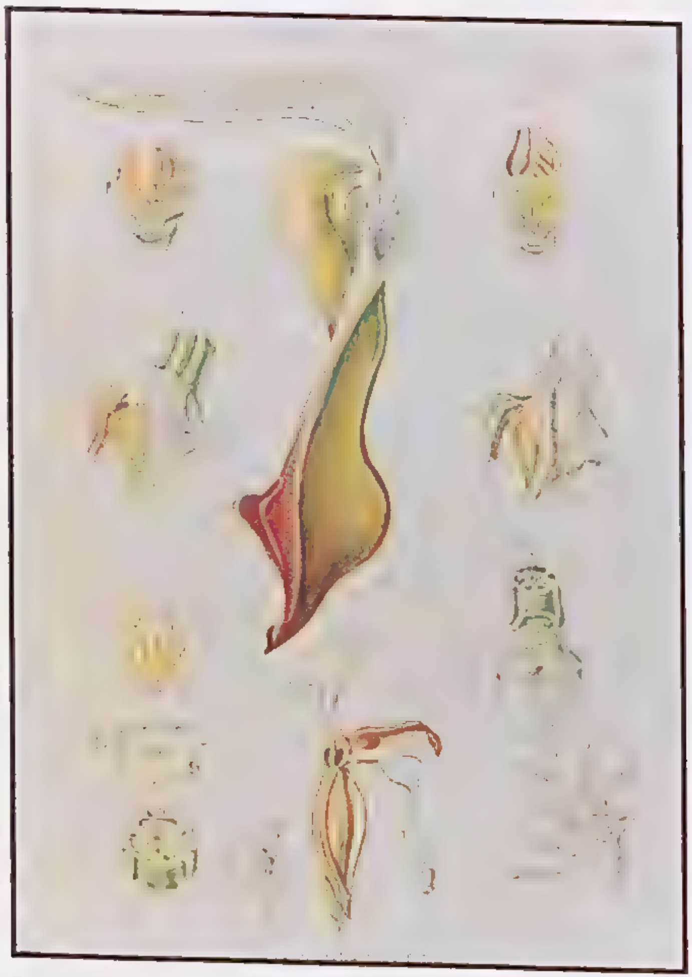

Plate 3: *Cryptostylis longifolia*

Plate 4: *Dendrobium speciosum*

FRANZ BAUER: THE EARLIEST ILLUSTRATOR OF AUSTRALIAN ORCHIDS

Tony Slater
159a Raleigh Street, Thornbury, Victoria 3071

Every Australian interested in botany, natural history or Australian history is possibly well aware of the two English botanists Sir Joseph Banks and Robert Brown. They both visited Australia on early exploration expeditions and had a great impact on describing the Australian flora. At the time of their visits and their subsequent work in England, the developments in photography were not advanced enough to be useful in illustrating their discoveries. Consequently they were accompanied on their voyages and in their work by artists or botanical illustrators. Two botanical illustrators used by Joseph Banks and Robert Brown were brothers — Ferdinand and Franz Bauer.

Ferdinand Bauer visited Australia between December, 1801 and May, 1805, when he accompanied Robert Brown and Matthew Flinders on the *Investigator* as the botanical illustrator (Norst 1989). Whilst Franz Bauer did not visit Australia, he was possibly the first illustrator of an Australian orchid. Franz was stationed at the Royal Botanic Gardens, Kew, England, where he worked with both Banks and Brown.

Franz Andreas Bauer (1758–1840) and Ferdinand Lucas Bauer (1760–1826) were the sons of a court painter to the Prince of Liechtenstein in Feldsberg near Vienna. Their father died when Ferdinand was only one-year-old and they were raised by their mother who encouraged their artistic interests. The two brothers were then discovered by Nicolaus Joseph von Jacquim (1727–1817), who was the professor of botany and chemistry in Vienna. The brothers worked for Jacquim, who taught them about the morphology and anatomy of plants, which was essential for accurate botanical illustration (Ducker 1990).

Jacquim pioneered the artistry of informative botanical drawings which was perfected by the Bauer brothers (Ducker 1990). Jacquim fostered their talents for observation and introduced them to the microscopic observation of plants, after which they accurately portrayed the minute details of their subjects. Franz was particularly esteemed for his knowledge and skill with microscopic work (Norst 1989).

In 1788 Franz set out with Jacquim's son on a European grand tour during which they intended to visit England and France. Jacquim was well known in Europe, corresponding with a number of scientists and was particularly friendly with Sir Joseph Banks (Norst 1989). Franz was engaged by Joseph Banks (in either 1788 or 1790) as a salaried botanical draughtsman to the Royal Gardens at Kew (Norst 1989; Ducker 1990). Franz illustrated many Australian plants, both from various collections made in Australia and also to illustrate the writings of Robert Brown (Ducker 1990). Franz was particularly interested in orchids and while Ferdinand was on the expedition to Australia he wrote back to Franz stating, that he wished he could send him back all the orchid types that he had seen so far (Norst 1989). Ferdinand collected both seeds and plants and Australian orchids were grown from these seeds in hot-houses at Kew Gardens (Ducker 1990).

Between 1830 and 1838 Franz published a series of drawings on orchid flowers and their reproductive organs (Bauer and Lindley 1830–1838). Included in these drawings were a number of Australian orchids. He drew *Bletia tankervilliae* (syn: *Phaius tankervilleae*) in 1802, *Cryptostylis longifolia* (syn: *C. subulata*) in 1825 (Plate 3) and *Dendrobium speciosum* in 1793 (Plate 4). This illustration of *D. speciosum* is possibly the earliest illustration of any Australian orchid and was done 11 years before J. E. Smith published the description of *D. speciosum* in Exotic Botany. It is uncertain if these illustrations were made from herbarium specimens or from plants cultivated after the seeds or material had been sent to either Joseph Banks or J. E. Smith in England by collectors in Australia (Cavanagh 1990).

John Lindley wrote the preface and comments in the book containing Bauer's illustrations. While referring to the illustrations of Bauer, he stated: "*They were made with a view to determine both the organs of fructification of the singular plants they represent. Explaining in the clearest manner the real structure of the anther and the pollen, with all the extraordinary apparatus that is peculiar to those organs — shewing the exact anatomy of the stigma, the stigmatic canal, the ovarium, the fruit and the seed — and hence illustrating the mode in which fructification is effected and the relation the several parts bear to each other*". (Bauer and Lindley 1830–1838). This book was published and written at the same time that Lindley wrote: "The Genera and Species of Orchidaceous Plants" (1830–1840) and the minute descriptions of the flowers that Lindley described were enhanced by the illustrations and observations of Bauer (Bauer and Lindley 1830–1838).

The illustrations of Franz Bauer were significant as they were the earliest illustrations of Australian orchids and they were also used by Robert Brown to confirm that plants reproduce sexually. At the time that these illustrations and observations were done by Bauer the microscope had only recently been developed by Robert Hooke (1635–1703) and Anton von Leeuwenhoek (1632–1723) (Ducker and Knox 1985). Prior to the observations of Franz Bauer and Robert Brown, sexual reproduction had not been confirmed in plants, although pollen had been assigned the same function as "male spermatic fluid" and "the presence of pollen on the stigma was necessary for the production of seeds" (Morton 1981).

In 1826, Robert Brown (1773–1858) published a microscopic study of unfertilised ovules describing their detailed structure for the first time. In an account to the Linnean Society of his studies into the reproduction of the 'Orchideae' and 'Asclepiadeae', Brown described changes in the cells of the stigma and style during development; the passage of the pollen tube from the stigma to the ovule, the entry of the tube through the micropyle and the subsequent embryo development (Brown 1833). Thus Robert Brown using the drawings of Franz Bauer confirmed for the first time that sexual reproduction did occur in flowering plants.

Franz Bauer remained at Kew where he worked as a botanical illustrator for the rest of his life (50 years) and was buried in the churchyard of St. Anne's on Kew Green only a few steps from his house and Kew Gardens (Ducker 1990).

The efforts of Franz was appreciated by his contemporaries and is remembered in a memorial tablet located inside St. Anne's church:–

> "Francis Bauer . . . In the delineation of plants he united the accuracy of a profound naturalist, with the skill of an accomplished artist, to a degree which was only equalled by his brother Ferdinand. In microscopical drawing he was altogether unrivalled and science will be ever indebted for his elaborate illustrations of animals and vegetable structures . . . The *works* of Francis Bauer are his best *monument.* Friendship inscribes this record on his honoured tomb." (Norst 1989).

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Plate 3: *Cryptostylis longifolia* as illustrated by Franz Bauer in 1825.

Plate 4: *Dendrobium speciosum* as illustrated by Franz Bauer in 1793.

✾

IN THE FOOTSTEPS OF REVD. H. M. R. RUPP THE ORCHID MAN OF PATERSON

Val Anderson
Honorary Curator
Paterson Court House Museum
Paterson Historical Society, Paterson, N.S.W. 2421

. . . and the search goes on!

Twelve months have passed and our small group, Bill and Mabs Keppie, Lyn Walsh, the writer and husband Bill are as enthusiastic as ever to retrace the native orchid recordings in the Paterson district by H. M. R. Rupp, Incumbent of the Parish of St Paul's Church, Paterson, 1926–30. Of the 68 plants listed by Rupp in an 11 mile (17km) radius of Paterson, 31 have been located and recorded by our photographer, Lyn.

It is such a pleasure to work with the quiet and unassuming Keppies. Bill, who has lived on his family's selection, "Glenlossie", Paterson* all of his 70 years, was joined by Mabs following their marriage nearly 50 years ago. Their understanding and knowledge of nature in the Paterson district is remarkable — the present success of our project could not have been possible without their tremendous co-operation.

Lyn Walsh is no newcomer to native orchids.

Lyn's parents citrus orchard at Somersby backs onto Crown Land and as a child Lyn inherited her parents love of bush orchids. Since moving to Martins Creek (a small rural area close to Paterson) with husband Brian in 1986 (both are senior staff members at Tocal Agricultural College, Paterson) Lyn's local knowledge of the district, first on horseback, then with baby Stephen in a backpack, has become extensive. This year during the spring flowering period Lyn has been active informing local property owners of these beautiful gems of nature.

For the Andersons — it is "second time around". Although our forté is epiphytic natives, our appreciation of terrestrials stems from our early days establishing the Newcastle Group of A.N.O.S. with good friends, Bob Raine and the late Bill Murdoch.

Bill and I have accompanied Bill, Mabs and Lyn on many weekend sorties "into the hills", but their mid-week trips to check plants and photographic conditions have been numerous.

The quality of soil in the district covered by Rupp is interesting. Cameron Archer, Principal of Tocal, Paterson, President of Paterson

Historical Society, local historian and a great supporter of our endeavours, with Dave Brouwer, also of Tocal have kindly prepared the following:–

> The soils in the Martins Creek area consist of three land systems. The low lands are of mostly a deep brown podzolic soil, the higher horizons being a light sandy loam over heavy clay sub soil.
>
> The more hilly country is also a brown podzolic. However, some soils may be shallow earths with areas that have skeletal soils.
>
> The mountainous areas have skeletal soils with rocky outcrops. There are isolated patches of shallow cracking clays and solonetzic and podzolic soils. In general, the soils are nutritionally impoverished and of limited potential agriculturally. Vegetation is of spotted gum and ironbark woodland with rainforest remnants in sheltered places.

In Bill Keppie's words, ". . . it's not much good for anything!" Mabs has found *Spiranthes sinensis* on "Glenlossie". This was not listed by Rupp. The large colony of *Pterostylis curta* found by Mabs in the grounds of St James Church, Martins Creek last year has flowered well again this year. To Mabs delight, this year she recorded a small patch of *Microtis parviflora* also in the church grounds. However, the elusive *Pterostylis truncata* which pleased Rupp so much has yet to appear.

In her wanderings in the high ridge country to the east of Martins Creek, Lyn has come across a most unusual remnant rainforest gully approximately 90 metres by 40 metres. Completely hidden around the perimeter by lantana, the floor comprises fractured volcanic rock very difficult to negotiate on foot, hosting in places, as well as on ficus and other rainforest trees, well over one hundred plants of *Dendrobium linguiforme* and one outstanding plant of *Sarcochilus falcatus*.

We eagerly await a visit from Bob Raine next year to identify an exceptional *Caladenia* found by Lyn well up in the hills behind Paterson's town water supply tank.

A recent presentation to Paterson Court House Museum of copies of Rupp's Paterson letters, research material and photographs by Lionel Gilbert, used by Lionel in his superb book, "The Orchid Man", has added greater momentum to our already buoyant enthusiasm.

We plan to commence our search earlier in 1994, this time across the Paterson River into the Mt. Johnson area where we hope to find more sitings of the native orchids recorded so many years ago by Herman Montague Rucker Rupp, THE ORCHID MAN OF PATERSON.

* "Glenlossie", Paterson is private property with no public access.

List of native orchids found to date from Revd. H. M. R. Rupp's recordings at Paterson — October, 1924 to April, 1927:–

Dendrobium speciosum Sm.
D. speciosum var. *hillii* F. v. M.
D. gracilicaule F. v. M.
D. aemulum R.Br.
D. linguiforme Sw. (Plate 5)
D. teretifolium R.Br.
Sarcochilus falcatus R.Br.
S. hillii F. v. M.
Cleisostoma tridentatum Lindl. (*Plectorrhiza tridentata*) (Plate 9)
Cymbidium suave R.Br.
Galeola cassythoides Reichb. (*Erythrorchis cassythoides*) (Plate 6)
Dipodium punctatum R.Br.
Calochilus campestris R.Br.
Thelymitra ixioides Lindl.
T. pauciflora R.Br.
T. carnea R.Br.
Diuris punctata Sm. (Plate 7)
D. aurea Sm.
D. palachila Rogers (Plate 10)
Corysanthes aconitiflores Salisb. (*Corybas aconitiflorus*) (Plate 8)
Microtis parviflora R.Br.
Pterostylis acuminata R.Br.
P. curta R.Br.
P. nutans R.Br.
Acianthus fornicatus R.Br.
Lyperanthus suaveolens R.Br.
Caladenia carnea R.Br.
C. alba R.Br.
C. caerulea R.Br.
Glossodia major R.Br.
G. minor R.Br.

Plate 5: *Dendrobium linguiforme.*

Plate 6: *Erythrorchis cassythoides.*

Plate 7: *Diuris punctata.*

Plate 8: *Corybas aconitiflorus.*

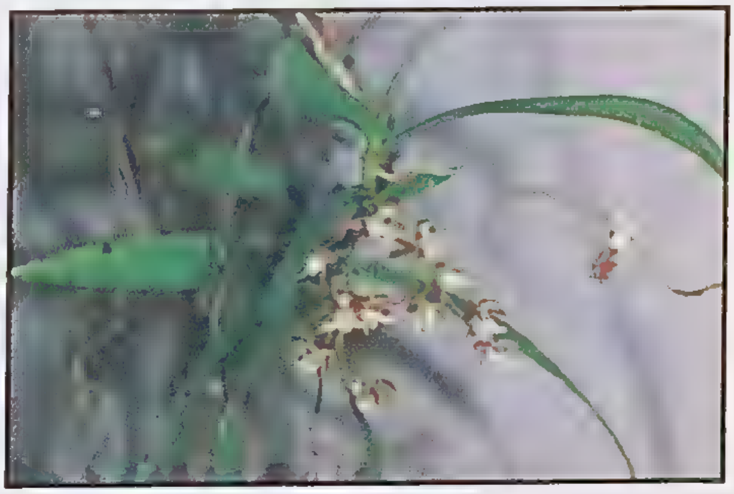

Plate 9: *Plectorrhiza tridentata.*

Plate 10: *Diuris palachila.*

Plate 11: *Sarcochilus dilatatus.*

Plate 12: *Bulbophyllum globuliforme.*

Photos 5 to 10: Lyn Walsh.

Photos 11 and 12: W. T. Upton.

NEW RECORDINGS FOR THE CALLIOPE RANGE

Gerry Walsh
7 Leslie Court, Werrington, N.S.W. 2747

In September, 1993, Mr Denis Johnson and myself revisited the Calliope and Dawes Ranges, approximately 70kms due west of Gladstone, in central coastal Queensland.

We had made our first trip to the region in September, 1992. On that visit we were surprised to find both *Bulbophyllum weinthalii* Rogers and *Dendrobium linguiforme* Swartz var. *nugentii* Bailey to be quite abundant thereabouts. Those observations represented an extension in distribution of 400kms north and 400kms south respectively to the previously recorded range of each species. (See *The Orchadian*, Volume 10, Number 10, Summer 1992/93).

The purpose of our 1993 visit to the region was to investigate areas of hoop pine forest we had not explored in 1992, but which we suspected may harbour other species not previously recorded so far to the north.

On the morning of September 13, we hiked several kilometres along dry, stony ridgetops. At one point we were surprised to find a small area of thorny bushes colonised by flowering plants of *Sarcochilus dilatatus* F. Muell. (Plate 11). The shrubs grew in a shallow depression surrounded by approximately two hectares of steep, sun-baked rock face. The general aspect of the location was west to north-west.

The presence of many clumps of *Dendrobium speciosum* var. *grandiflorum* suggested that the shrubbery had only established after the dendrobiums had provided a firm foothold and some organic matter in which to take root. Also growing in the same shrubbery was *Plectorrhiza tridentata.* Both the *Plectorrhiza* and the *Sarcochilus dilatatus* were quite stunted and surviving under harsh conditions.

In another location at a much lower altitude, we again found numerous specimens of *S. dilatatus.* Conditions were far more conducive to orchid growth at this spot. The plants were in excellent condition. Some specimens were quite large. They had already finished flowering — many months earlier than this species blooms in the southern part of its range.

The three references consulted, i.e. Dockrill (1969), Jones (1989) and Upton (1992) give the northern limit of distribution for *S. dilatatus* as the Burnett River and Bundaberg. The Calliope Range is 150kms further north.

Mr John Roberts believes (pers. comm.) that *S. dilatatus* has been found as far north as Gladstone, but I was unable to find evidence of such. This demonstrates prefectly the need to document any unusual aspects relating to our native orchids or their distribution as a matter of necessity and importance.

On the same ridge we found two separate colonies of a large yellow *Diuris.* Each colony supported about six plants. Photos were later shown to Mr John Riley and Mr Jim Lykos, both knowledgeable in the field, who thought them to be *D. sulphurea* R.Br. If so, it seems that our Calliope Range recording represents a northern extension in distribution of at least two to three hundred kilometres.

Later on we descended into a deep valley of dry forest dominated by pristine hoop pines, many of them of enormous proportions. We were very surprised to find good numbers of the diminutive *Bulbophyllum globuliforme* Nicholls (Plate 12). They were not flowering but vegetative characteristics were identical to plants we had seen in the McPherson Range.

The Calliope Range population of *B. globuliforme* colonises the same type of hoop pine limbs as the southern forms do, i.e. the upper emergent limbs up to about arm thickness. The only distinction we could discern was that the southern hoop pines supporting *B. globuliforme* were restricted to the ridge tops. At Calliope, the host hoop pines were deep in a valley.

B. globuliforme was previously thought to be restricted to the McPherson Range. However, Jones (1989) records it as occurring at Maleny, some 90kms further north. Roy Gifford reports (pers. comm.) that he found *B. globuliforme* on the Jimna Range in 1985, at about the same latitude as Maleny. His observations were also reported in A.N.O.S. Far North Coast Group Bulletin around 1986.

The Calliope Range population of *B. globuliforme* represents an extension in distribution of approximately 375kms northwards.

Epiphytic orchid species observed in the Calliope Range in September, 1992 and September, 1993 now total 20. These are: *Dendrobium aemulum* (ironbark and brush box forms), *D. bowmanii, D. gracilicaule, D. linguiforme* var. *nugentii, D. monophyllum, D. speciosum* var. *grandiflorum, D. teretifolium* var. *aureum, D. teretifolium* var. *teretifolium, Sarcochilus ceciliae, S. dilatatus, S. falcatus, S. olivaceus, S. roseus, Bulbophyllum globuliforme, B. minutissimum, B. schillerianum, B. weinthalii, Plectorrhiza tridentata, Cymbidium canaliculatum* and *C. suave.*

It is hoped that a further exploration of this extremely interesting region can be undertaken in another year or so. I feel certain that other worthy finds await discovery. ✿

SUNDAY, 15th MAY, 1994

is

Ken Russell's Dungog Open Show

This is No. 6, all previous days have been spectacular, this year it will be even better. Everybody will be there.

The new venue is —

THE DUNGOG HIGH SCHOOL
HOOK STREET, DUNGOG

Get there as early as you like, someone will be there from first light. If you go the night before there is always an orchid gathering in the Bowling Club.

Ken & Noelene's phone number is (049) 92-1291

AUSTRALIAN NATIVE ORCHID HYBRID REGISTRATIONS

(New registrations from lists in *The Orchid Review*, November/December, 1993)

Name	**Parentage**	**Registered by**
Dendrobium		
Brown King	*undulatum* X *speciosum*	Florafest
Chablis	*gracilicaule* X *bigibbum*	W. T. Upton
Gillieston Pearl	Rutherford Surprise X Gulginni	Florafest (W. Skillicorn)
Jonathan's Glory	Aussie Angel X Kingrose	I. Klein
Zeppelin	Zip X Ellen	J. Purvis
Sarcochilus		
Powder Puff	*ceciliae* X Fitzhart	Florafest
HYBRID WITH ONE NEW ZEALAND PARENT		
Sarcomoanthus		
Emarcy Gem	*Sarcochilus ceciliae* X *Drymoanthus adversus*	M. R. Campbell

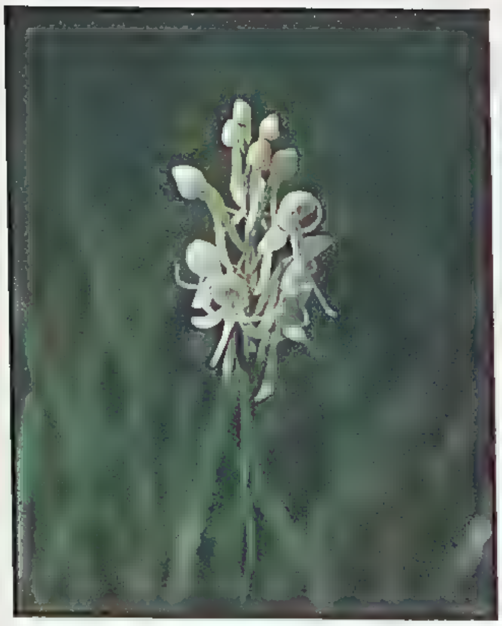

Plate 13: *Habenaria propinquior* the most abundant *Habenaria* species in the lowlands.

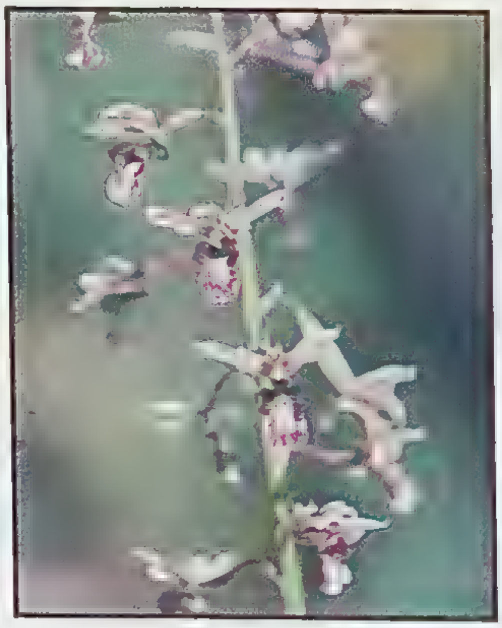

Plate 14: *Eulophia bicallosa* a rarely seen but reasonably common species of the taller Melaleuca forests.

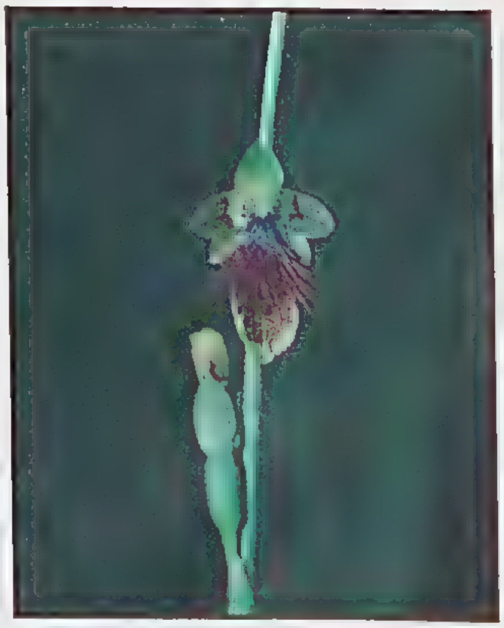

Plate 15: *Calochilus caeruleus* a common species in the Melaleuca forests.

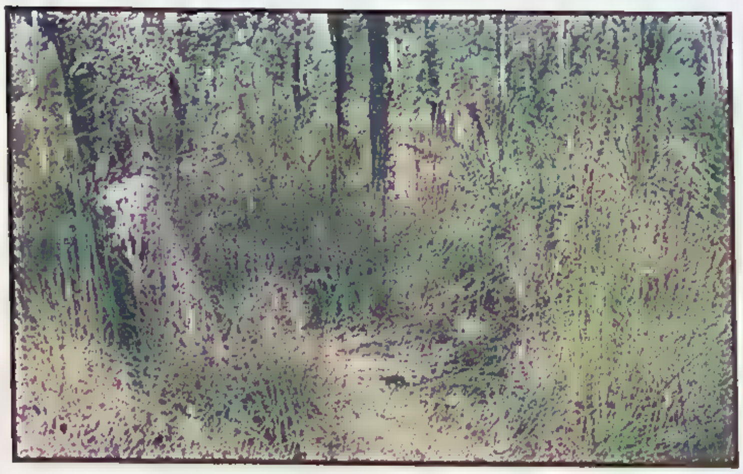

Plate 16: Habitat of *Eulophia bicallosa*.

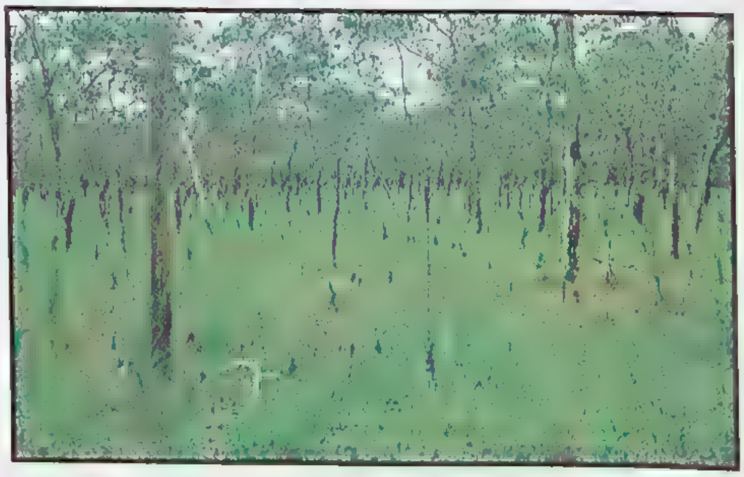

Plate 17: Good terrestrial orchid habitat near Sunday Creek.

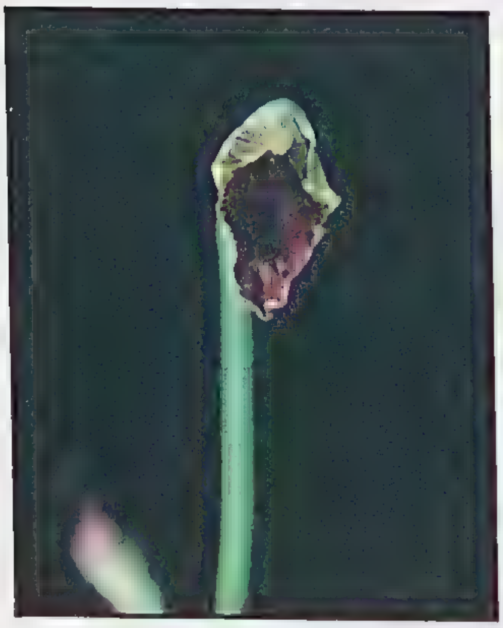

Plate 18: *Calochilus psednus* a very rare species limited to a small area of Melaleuca forest near Sunday Creek.

Plate 19: *Arthrochilus stenophyllus* a recently described species abundant in the Cardwell area.

Plate 20: *Didymoplexis pallens* a delicate saprophyte which flowers in the wet season and is easily overlooked.

Photos by P. S. Lavarack.

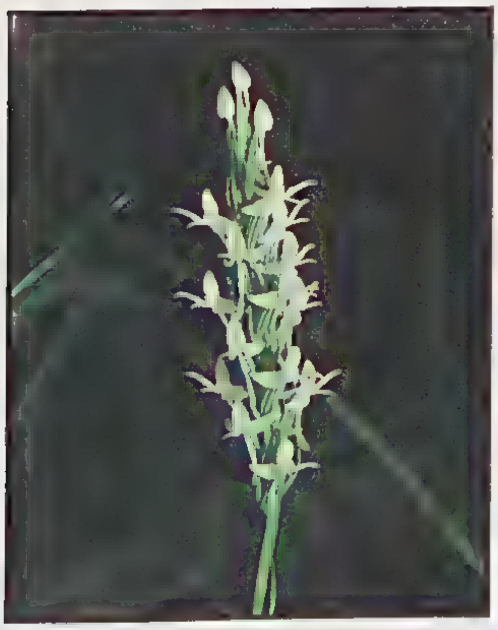

Plate 21: *Habenaria holtzei* an attractive species of eucalypt forests near Cardwell.

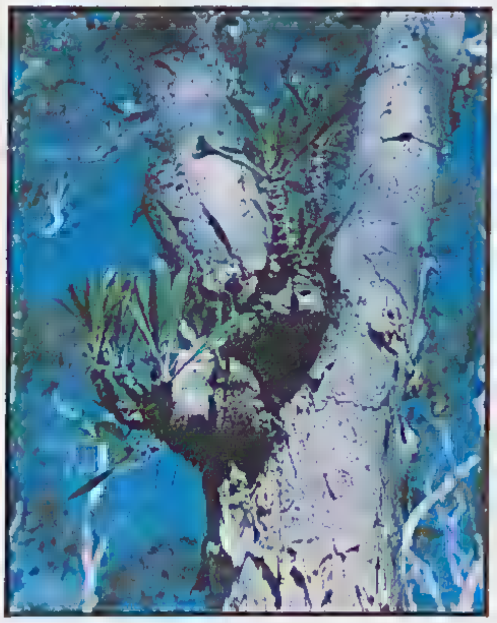

Plate 22: *Myrmecodia* sp aff *beccarii* an ant plant, possibly undescribed which is abundant in the Melaleuca forests near Cardwell.

Plate 23: *Thelymitra pauciflora* Sunday Creek is the only place in the wet tropics where a sun orchid is known to occur at sea level.

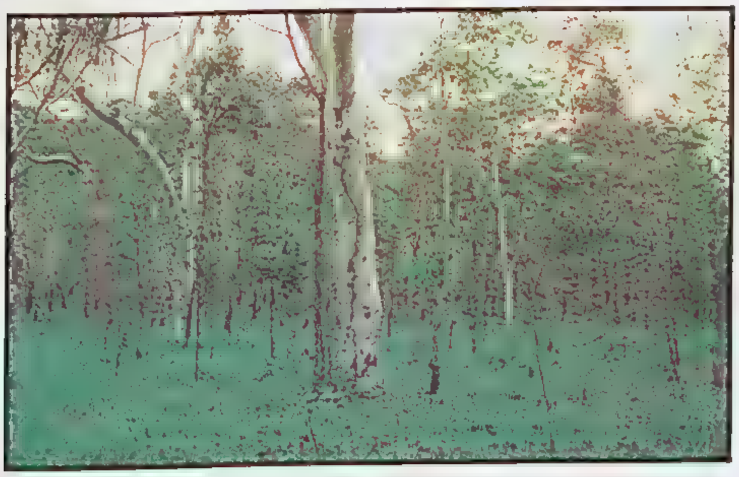

Plate 24: Eucalypt forest near Sunday Creek.

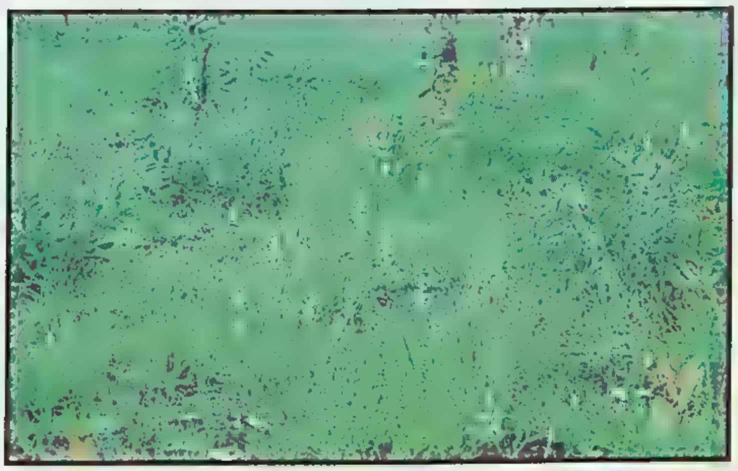

Plate 25: A carpet of flowers of *Habenaria propinquior*.

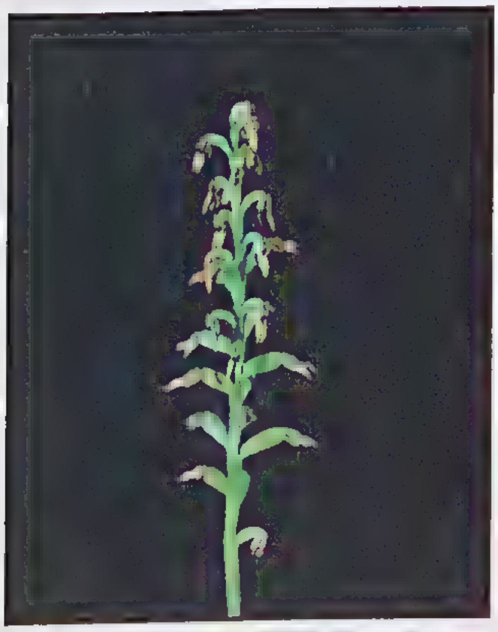

Plate 26: *Genoplesium tectum* one of the recently described and very rare species from the Sunday Creek area.

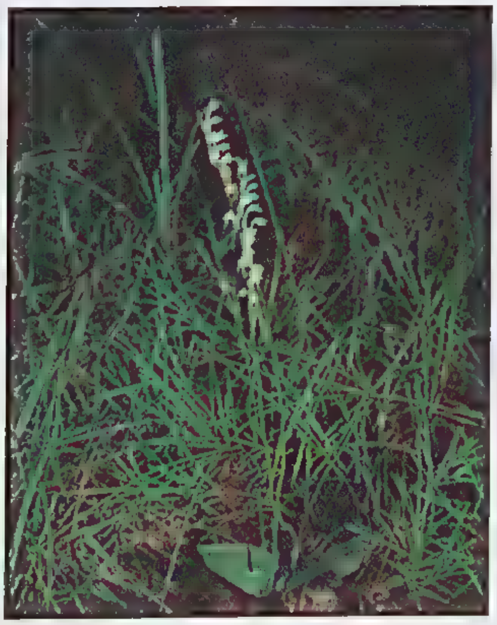

Plate 27: *Peristylus candidus* an uncommon species from creek banks in eucalypt forest.

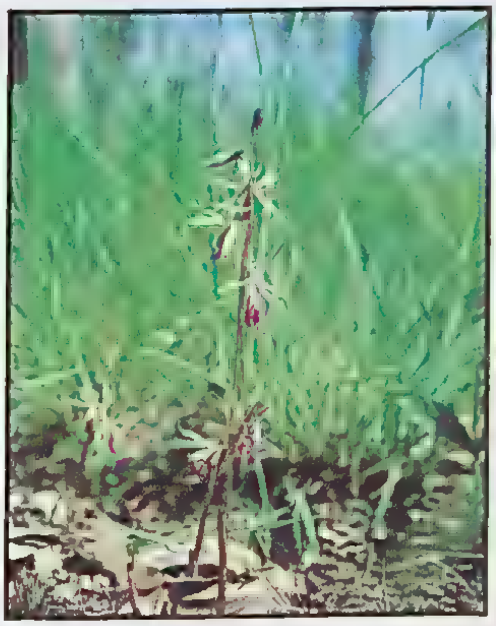

Plate 28: *Nervilia holochila* an abundant species from eucalypt forest, one which is rarely seen in flower.

Photos by P. S. Lavarack.

THE CARDWELL TEA TREE FORESTS — A PROLIFIC ORCHID HABITAT IN DANGER

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INTRODUCTION

Between the Cardwell Range and the town of Tully the Bruce Highway passes through a mosaic of open forests alternating between eucalypt forest and low tea tree forests. At least where the forests remain this is the case, as much of the forests have been cleared for sugar cane, grazing, mariculture or pine plantations. To the casual passer-by the forests look rather uninteresting, compared to the rainforests of the country north of Tully. Clearing of melaleuca forests was, for many years, regarded as being of little importance, as the country was almost universally regarded as "poor" or "depauperate" or "rubbish" with little or no valuable timber and poor soil. They were seen as habitats which should be developed if a use could be found for them.

Outwardly similar forests occur along the coastal plain from about Gladstone north, but it is only in three localities that they occur in high rainfall areas: (1) on the central coast near Mackay; (2) the wet tropics between Townsville and Cooktown and (3) the Iron Range-McIlwraith Range area on Cape York Peninsula. The forests in the high and low rainfall areas have much the same canopy species but it is in the ground layer that the real differences occur.

TERRESTRIAL ORCHIDS

The terrestrial orchids are an undoubted feature of the ground layer of these forests. Twenty-three terrestrial species have been recorded in these forests between Tully and Ingham, 15 of them in the tea tree (*Melaleuca viridiflora*) forests and the rest in mixed eucalypt forest (see Table 3). This may not seem an extremely high number when compared with southern temperate areas, but for a tropical lowland area, it is unusually high.

North of Cardwell the coastal plain broadens out in the Murray and Tully valleys to 20 or more kilometres. However south of Cardwell it is narrow, ranging from less than one kilometre to five kilometres and it is here that many of the interesting orchid finds have been made. In this area eucalypt forest covers the better-drained sites and tea tree forest occupies the poorly-drained low-lying sites. Rainforest is limited to narrow bands along the streams.

The rainfall is seasonal with the bulk of the rain falling in the period from December to July. Storms start as early as October, but are extremely unreliable. The true wet season from January to May is more reliable, but can fail in some years. In a good wet season the soil in the melaleuca forests is waterlogged for months. For a good flowering the terrestrial orchids require an early start to the wet season with good rain in November and December, followed by soaking rain in January and February.

The orchids must be able to cope with the dry season in which the ground in the tea tree forests can set as hard as concrete. The terrestrial orchids follow four strategies to cope with these demanding conditions.

(1) **Pre-wet season flowering** (e.g., *Nervilia*) These species weather the dry season as underground tubers, losing their leaf in about September. If there are sufficient early rains in November-December, the plants respond rapidly by flowering within a week or so of the rain. The flowers are delicate and last less than two weeks in most species. The leaf is then produced immediately after. If the early rains do not eventuate, which occurs perhaps two out of every three years, there are no flowers. Other genera which generally follow this strategy include *Didymoplexis, Arthrochilus.*

(2) **Wet season flowering** (e.g., *Habenaria*) These species also survive the dry as tubers which lose their leaves in the latter part of the dry season. They then respond to the early rains by producing leaves in December-January, followed by the flowers in January. Very few plants flower if the rains fail or are rather meagre or are late. When the ground is soaked by a good wet season which starts early, the tea tree forests come alive with a carpet of white flowers of two or three species of *Habenaria*. In 1993 the wet season was reasonable in its total, but the rain did not start in earnest until about March, too late for the orchids and flowering was sparse. Other genera which follow this strategy include *Peristylus, Calochilus, Genoplesium.*

(3) **Non-deciduous dry season flowering** (e.g., *Eulophia, Dipodium*) These are larger species which have leaves for most, if not all of the year. The flowering occurs in the period from June to October and are not obviously related directly to the wet season rainfall. While *Dipodium* flowers regularly each year, *Eulophia bicallosa* apparently flowers only occasionally.

(4) **Deciduous dry season flowering** (e.g., *Thelymitra, Microtis*) These two genera produce flowers in late winter and early spring which is the middle of the dry season. They produce leaves during the wet season and flower as the leaves are about to die off. This is similar to many terrestrials in south Queensland and on the mountains in north Queensland which flower in the spring.

THREATS AND CONSERVATION

The best of the tea tree forests lie between Tully and Ingham with a concentration from a little north of Kennedy to the Cardwell Range. Part of the southern section of these forests have been included in the Wet Tropics World Heritage Area. An even smaller part is in the Lumholtz National Park. These reserves offer good protection as the plants generally are not sought after by collectors. The exception to this rule is *Phaius tankervilleae* which has now been so heavily collected that few remain in this area.

Land clearing: The bulk of the occurrences of this forest are not protected and large tracts have been cleared for sugar, cattle, pine plantations and lately for mariculture. Clearing for mariculture is still continuing south of Cardwell and, as the area has never been examined closely for terrestrial orchids, it is not known if any new, rare or endangered species have been destroyed.

Much of the orchid-rich habitat south of Cardwell has been cleared for pine plantations. The most suitable habitat for exotic pines has proved to be the better drained ecualypt forests, but some melaleuca forests have been destroyed in the process.

A factor which has had both positive and negative effects on the clearing rate in the coastal lowlands is the recent rediscovery of the long-lost mahogany glider. This small, attractive gliding possum had not been reported for nearly 100 years until recently identified at Barret's Lagoon near Tully. Previously the few specimens had been assumed to be the more common sugar glider, but research has now conclusively shown them to be separate species. This very rare species is now known to occur on the coastal lowlands from Tully to Crystal Creek, always below the 100 metres contour. As most of its habitat has been cleared, it is considered endangered. Its recent rediscovery has lead to a moratorium on clearing on State Forests and other State-owned land, but has resulted in an acceleration in clearing on freehold as owners seek to clear before it is found on their land perhaps leading to the prevention of future clearing.

When all this is added together the result is a patchwork of remnant habitat with perhaps two thirds now cleared. By far the best remaining forests are those between Cardwell and the Cardwell Range and it is to be hoped that additional clearing in this area can be prevented due to the occurrence of the mahogany glider and at least two endangered orchids and an endangered species or variety of ant plant (*Myrmecodia beccarii*) and the very rare apollo jewel butterfly, the larvae of which live in the ant plants. The ant plants suffer from three distinct threats — the land clearing, collectors who collect the ant plant to grow and butterfly collectors who cut the ant plants open to get the larvae of the rare butterfly.

Changing ecology: There seems little doubt that the ecology of the terrestrial orchids is related to the frequency of fire to a greater or lesser degree. Some species such as *Didymoplexis pallens* flower freely after a fire. Others appear not to flower well if the ground layer is too thick — e.g. *Habenaria* spp. Fire appears to be related to the density and the composition of the ground layer, although the details are not clear at present. If grasses take over from sedges in the ground layer it appears that most terrestrial orchids are eliminated or at least greatly reduced. Such changes are related to fire and to changing drainage such as when adjacent land is cleared and drained.

Clearly, in managing the forests to ensure the survival of these species the fire regime is important. Probably areas such as these would have been burnt about every two or three years by the Aboriginals and a regime somewhat similar to this has remained under Forestry management. An indication of what can happen if fire is excluded can be seen on the west coast of the nearby Hinchinbrook Island where there have been few fires since Aboriginals left the area about 90 years ago. All along this coast, open forests dominated by eucalypts and melaleucas have been invaded by rainforest and the terrestrials which would have once been present are now gone. The resulting rainforest is low in species diversity and has few epiphytic orchids so that the net result is a decline in orchids numbers and diversity.

EPIPHYTIC SPECIES

The coastal forests which comprise eucalypt forests, melaleuca forests, mangroves and rainforests, include only a handful of epiphytic species (see Table 2). None of these is remarkable and all are widespread species. None is listed as Rare or Threatened, but one has to wonder about the future of the tea tree orchid, *Dendrobium canaliculatum.* Two hundred years ago it must have been just about the most common orchid in northern Australia. Now with wholesale clearing of the habitat and resultant destruction of millions of individuals and continuing collection by the public, what is the future of this most attractive miniature species? Len Lawler has estimated that around 1,000 million plants of *D. canaliculatum* were destroyed when 200,000 hectares of tea tree forest was cleared south of Bowen recently (Lawler 1993). The area cleared in the wet tropics is less but numbers lost there would certainly be in the millions if these estimates are correct.

My estimate is that 95% of collected plants are dead within two years of collection. This is perhaps not a problem if the plants come from fallen timber on cleared land, but it is a concern if the plants come from surviving habitat — particularly if the habitat is in the wet tropics region of north Queensland. Although common the tea tree orchid is a species which requires some legislative protection to prevent removal from the wild and an effort to provide flask-raised seedlings for distribution to take pressure off wild populations.

CASE STUDIES

1. *Calochilus psednus* D. Jones and Lavarack.

Status	**2E**
Locality	**18'30" 146'11"**
Threat	known only from a very limited range — about 200 metres by 200 metres. May be sensitive to changing fire patterns.

One of the "bearded orchids", this species was described in 1989. It has only been recorded from the banks of Sunday Creek, about 30km south of Cardwell. It has been searched for without success in surrounding areas, but as it can only be identified when in flower and it only flowers in good wet seasons, it is possible it is more common than presently believed. No flowering plants were located in the wet seasons of 1992 and 1993. This was undoubtedly due to poor wet seasons in those years. A highway diversion south of Sunday Creek constructed about four years ago appears to have been placed through the only known population.

2. *Genoplesium tectum* D. Jones.

Status	2E
Locality	18'30" 146'11"
Threat	known only from a very limited range — two sites about 1km apart. May be sensitive to changing fire patterns.

This species was described in 1989, although its existence has been known for about 20 years. It has only been recorded from a small area between Sunday Creek and the base of the Cardwell Range — a distance of about two kilometres long by one kilometre wide. It has been searched for without success in surrounding areas, but is easily overlooked and it is possible it is more common than presently believed. Three flowering plants were located in 1992 and none in 1993, but these are extremely difficult plants to find.

Action for both species:

- ensure the maximum preservation of tea tree forests in the area between Tully and Ingham;
- in particular ensure that no further disturbance occurs to the tea tree forests in the vicinity of Sunday Creek;
- carry out searches for these species in other areas;
- research the ecological requirements of these species;
- carry out research on fire regimes necessay to maintain existing ground cover in the tea tree forests;
- in the meantime ensure that the tea tree forests are burnt every three to five years in a way that ensures that no more than one quarter is burnt in any year.

Table 2 — Epiphytic orchids of the Cardwell lowlands

Name	Habitat	Flowering time
Dendrobium canaliculatum	m	July-Nov
Dendrobium discolor	s,r,e	July-Nov
Dendrobium teretifolium var. *fasciculatum*	s,r	Aug-Oct
Dendrobium smilliae	e,r	Aug-Jan
Eria fitzalanii	e,r	Aug-Dec
Cymbidium madidum	s,r	Aug-Oct
Cymbidium suave	r	Aug-Oct
Thrixspermum platystachys	r	all year

Habitat codes

m = melaleuca forest
e = eucalypt forest
r = rainforest
s = mangroves

Table 3 — Terrestrial orchids of the Cardwell lowlands

Name	Habitat	Flowering time	Strategy (see text)	Threatened status
Arthrochilus dockrillii	e	May-Nov	4	
Arthrochilus stenophyllus	m	Dec-April	1	2K
Calochilus caeruleus	m	Jan-April	2	
Calochilus psednus	m	Jan-April	2	2E
Didymoplexis pallens	e,m	Dec-May	1	
Dipodium ensifolium	e	Sept-Nov	3	
Eulophia bicallosa	e,m	Aug-Nov	3	3R+
Genoplesium tectum	m	Dec-Feb	1	2E
Geodorum densiflorum	e,m	Dec-Jan	2	
Habenaria propinquior	m	Jan-May	3	
Habenaria rumphii	e	Jan-April	2	
Habenaria xanthantha	m	Jan-April	2	
Habenaria sp aff *ochroleuca*	e,m	Dec-Feb	2	
Liparis habenarina	e,m	Jan-Mar	2	
Microtis parviflora	m	Aug-Oct	4	
Nervilia holochila	e	Nov-Dec	1	
Nervilia plicata	e	Nov-Dec	1	
Nervilia uniflora	e	Nov-Feb	1	
Nervilia sp	e	Nov-Dec?	1	
Pachystoma pubescens	e,m	Nov-Dec	1,3?	3R+
Peristylus candidus	e	Jan-Mar	2	
Phaius tankervilleae	m	Jul-Sept	3	3E+
Thelymitra pauciflora	m	Jul-Oct	4	

Habitat codes

m = melaleuca forest
e = eucalypt forest

Endangered codes *(from Thomas and McDonald 1989)*

2 = species with a very restricted distribution, i.e. less than 100km
3 = species with a distribution more than 100km
E = species at risk of disappearing from the wild in 10 to 20 years
V = species likely to be at risk over a longer period
R = species considered rare, but not endangered or vulnerable
K = poorly known species suspected of being at risk
+ = species occurring outside Australia

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Reprinted from: Austrobaileya 3(3): 331–333 (1991)

A NEW SPECIES OF *BULBOPHYULLUM* THOUARS SECTION *MICROMONANTHE* (ORCHIDACEAE) FROM NORTH-EASTERN QUEENSLAND

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Summary

Bulbophyllum wolfei B. Gray & D. Jones, a new species of *Bulbophyllum* Thouars section *Micromonanthe* from north-eastern Queensland is described and illustrated.

Bulbophyllum wolfei B. Gray & D. Jones **sp. nov.** affinis *B. bowkettiae* Bailey sed rhizomatis angustioribus, pseudobulbis minoribus, foliis valde crassioribus, floribus minoribus et plus nutantibus, pedicellis tenuissimis, labello minore lobis lateralibus pauce productis. **Typus:** Queensland. COOK DISTRICT: State Forest Reserve 144, Parish of Spurgeon, Wren Logging Area, 16°11′S, 145°05′E, 940 m, 22 August 1984, *B. Gray* 3529 (holo: QRS; iso: BRI,NSW,MEL).

Plant epiphytic. Rhizomes creeping, much branched, spreading; c. 1.5 mm diameter, adhering closely to the substrate, when young covered by pale grey-brown scarious bracts, becoming naked and furrowed with age; roots wiry, c. 0.2 mm diameter, arising from rhizome nodes; pseudobulbs 10–60 mm apart, 4–9 mm × 3–5 mm, more or less ovoid, green, faintly sulcate, appressed to the rhizome. Leaf lamina 9–25 mm × 3–6 mm, linear-elliptic to linear-oblong, thick and fleshy, shallowly V-shaped in cross section, more or less sessile. Flowers 5–8 mm diameter, solitary at nodes on bracteate, strongly nodding pedicels c. 2 mm long, cream with prominent red to maroon longitudinal stripes; dorsal sepal c. 6.5 mm × 2 mm, linear-elliptic to linear-ovate, cucullate over column, apex cymbiform; lateral sepals c. 6.5 mm × 2.5 mm, triangular-lanceolate, asymmetric, widely divergent, apex cymbiform; petals c. 2 mm × 1.2 mm, asymmetrically ovate, whitish, apex truncate to retuse; labellum c. 4.8 mm × 2 mm, thick and fleshy, maroon, erect in proximal third then curved forwards, dorsal surface smooth, ventral surface verrucose to papillose, obscurely three-lobed, obtuse, apex obtuse; column c. 1.2 mm long; stelidia c. 0.5 mm long, linear, slightly curved, subulate; column foot c. 1.2 mm, slightly curved forward; anther cap c. 1 mm × 0.8 mm, with a beak-like rostrum. Capsule not seen.

Additional specimen examined: Windsor Tableland, Feb 1990, *Jones 4353* & *Clements* (CBG).

Distribution and habitat: At present this species is known only from the Mt Windsor Tableland where it grows on the upper branches of trees in highland rainforest above 900 m altitude.

Flowering period: Sporadically from April to September but flowering has occurred as early as January under glasshouse conditions.

Notes: *B. wolfei* is closely related to *B. bowkettiae*, but is readily distinguished by the much thicker leaves and the smaller, strongly nodding flowers. Plants form larger, sparser clumps than those in *B. bowkettiae*, have very slender rhizomes and smaller pseudobulbs relatively distinct on the rhizomes. *B. wolfei* is at present known from only a few plants but because of its superficial resemblance to *B. bowkettiae* it is probable that it has often been mistaken for that species, however, all specimens of *B. bowkettiae* examined appear to have been correctly identified. *B. bowkettiae* is a much more common species occurring from the McIllwraith Range south to the Tully River.

Conservation status: 2RC according to the criteria of Briggs and Leigh (1988).

Etymology: It gives us great pleasure to name this orchid in honour of Mr T.J. (Tom) Wolfe, of Atherton, Queensland. As well as being a great companion in the bush he has been of significant help in our orchid research.

Acknowledgements

The authors wish to thank Barbara Jones for processing the manuscript.

Reference

BRIGGS, J.D. & LEIGH, J.H. (1988). Rare or Threatened Australian Plants. 1988 Revised Edition. Australian National Parks and Wildlife Service Special Publication No. 14. Canberra: Australian National Parks and Wildlife Service.

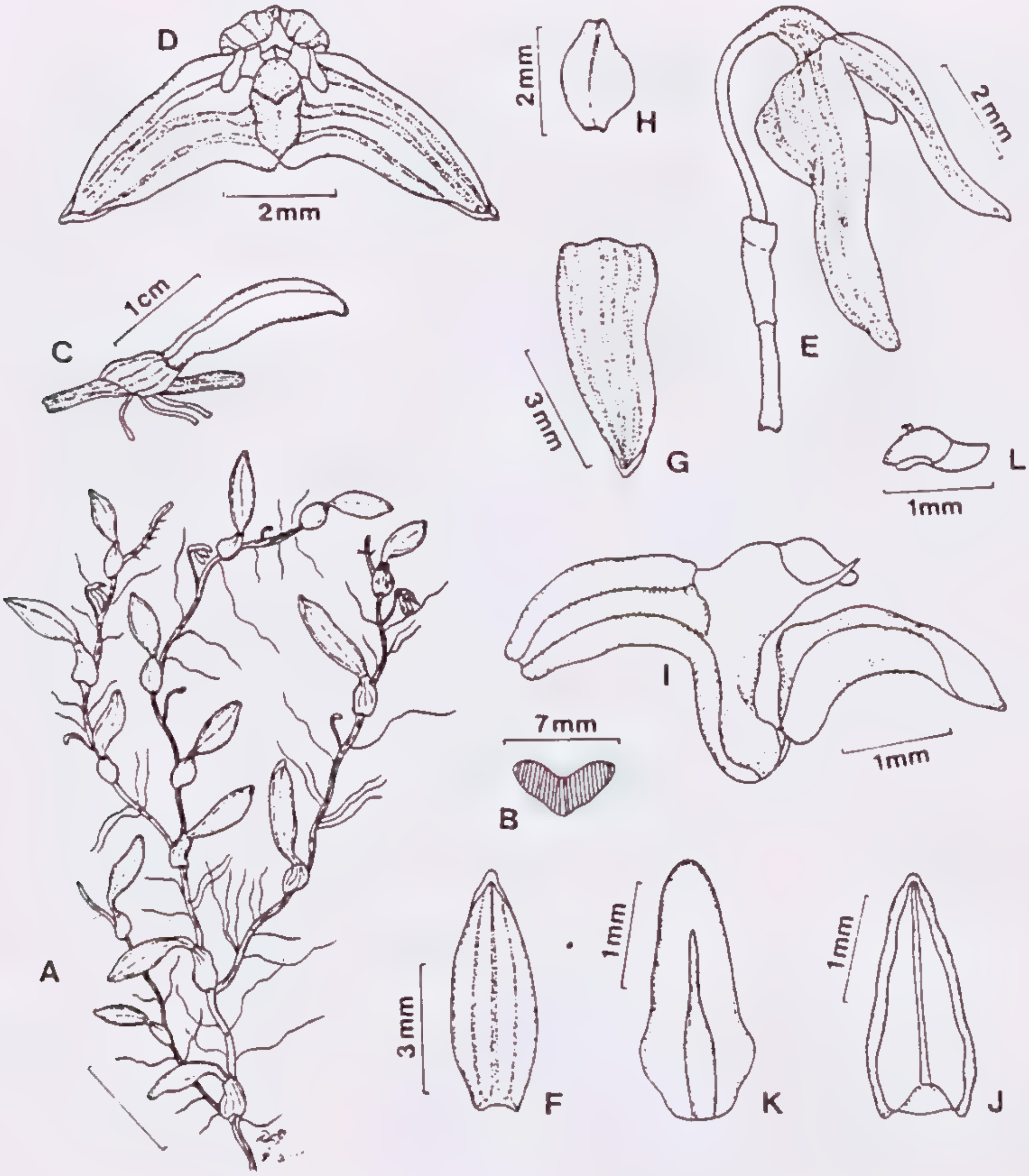

Fig. 1. *Bulbophyllum wolfei*: A. habit. B. section through leaf. C. section of rhizome, pseudobulb and leaf. D. flower from front. E. flower from side. F. dorsal sepal. G. lateral sepal. H. petal. I. column and labellum from side. J. labellum from below. K. labellum from above. L. anther from side. All from Jones 4353.

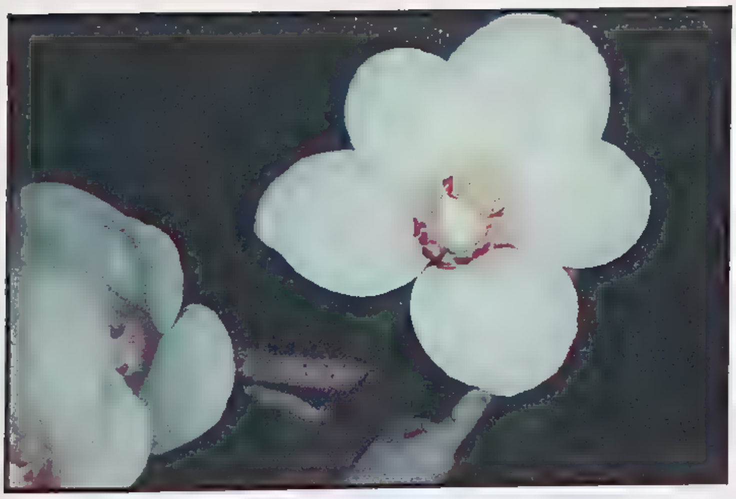

Plate 29: *Sarcochilus hartmannii* 'Roberta'.
Photo: R. Napier

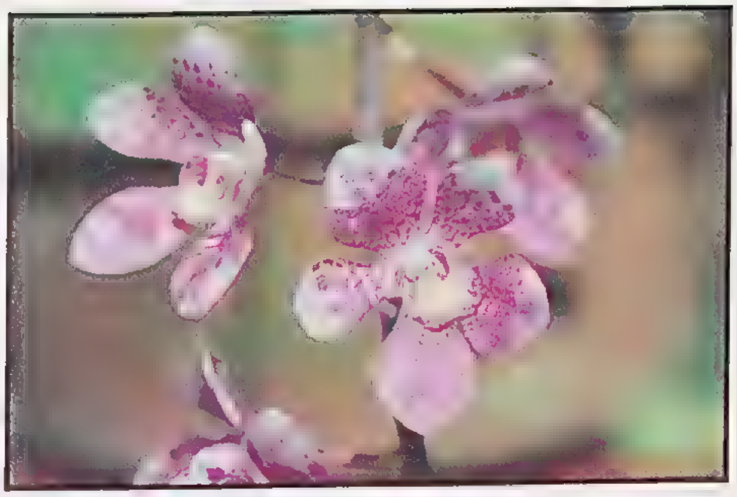

Plate 30: *Sarcochilus* Pinky.
Photo: R. Napier

Plate 31: A.N.O.S. Newcastle Group Show.
Photo: Russell Smith

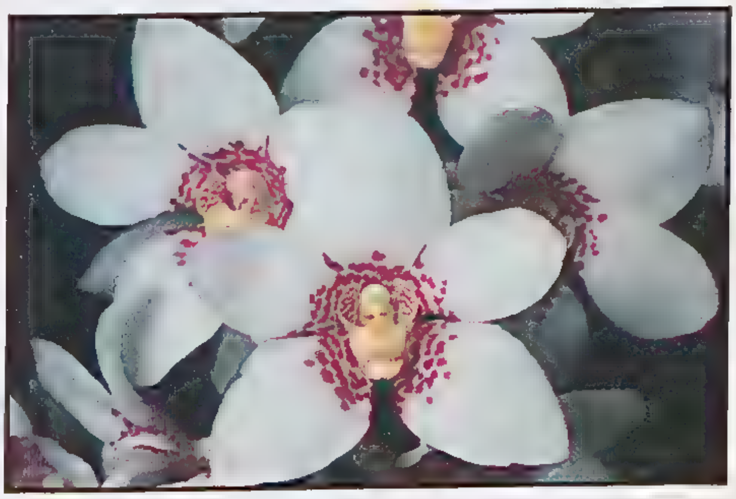

Plate 32: *Sarcochilus* Heidi.
Photo: D. Titmuss

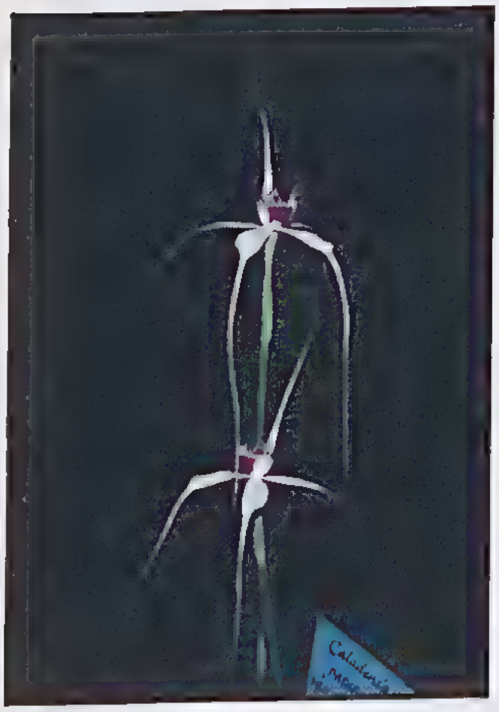

Plate 33: *Caladenia longicauda.*
Photo: Loris Peggie

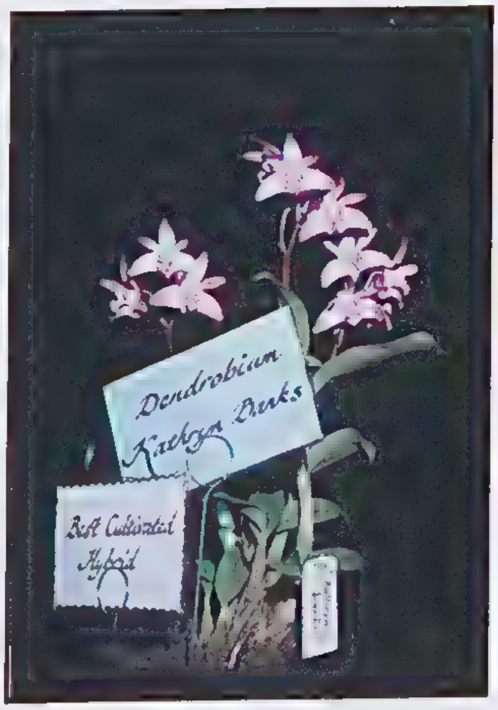

Plate 34: *Dendrobium* Kathryn Banks.
Photo: Loris Peggie

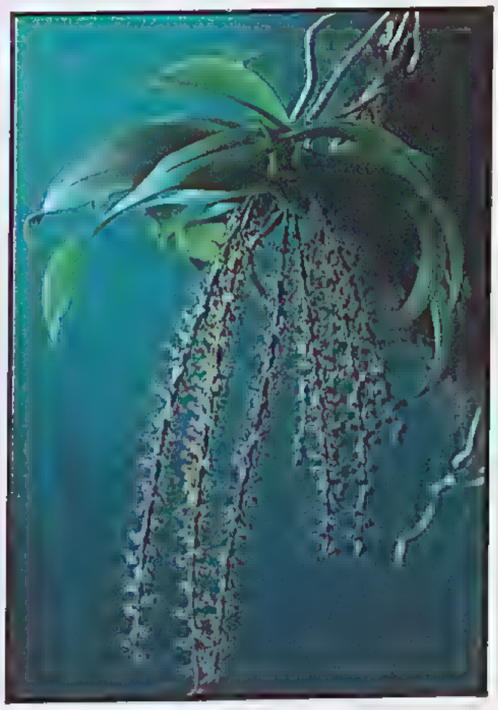

Plate 35: *Peristeranthus hillii.*
Photo: D. Titmuss

SHOW REPORTS

A.N.O.S. VICTORIAN GROUP INC.
Spring Show
2nd & 3rd October, 1993

Helene Wild

Have you noticed that the older you get the quicker the years pass? It must mean something (not that I'm admitting to growing old) but it seems like no time at all since our last spring show! And something else I've noticed — have you ever heard an orchid grower say that his orchids will be in peak condition for the show? Neither have I! Their annual wail is either: "I won't have anything out in time for the show!" or "I won't have any flowers left for the show!" This year we Melbournians experienced yet another mild winter which resulted in an early season . . . so would our members still have enough flowers to make an acceptable display? Yes they did . . . we made it happen!

The Herbarium looked wonderful and the quality of the plants was up to our usual high standard. Weatherwise Saturday was glorious and Sunday was appalling with drenching rain all day.

We again made a feature of species epiphytes, this time on tiered benches and mesh panels at the front of the hall and were delighted with the large number of beautifully grown plants displayed. We also set aside special areas for early *Sarcochilus* (species and hybrids) and species indigenous to the New Guinea highlands.

The terrestrial display occupied the island benches in the centre of the hall and special thanks go to Peter Branwhite (from Albury, New South Wales) who always supports our shows. Peter arrived early on Saturday morning (I shudder to think of the hour he would have left home) with a large load of beautifully grown terrestrials; and I must admit the terrestrial display would have been pretty lean if he had not brought his plants. We were relieved to hear that Peter arrived home safely on Sunday night as he must have had a nightmare drive back through the flood area of central Victoria.

Although our Society is non-competitive, three prizes are awarded at our spring show:–

Neil and Fay Allison, from Drouin, arrived at the Herbarium with a mini van and trailer load of plants (about 50 in all) including two hernia-making *Dendrobium speciosum* — a large plant in a square wooden box which was placed at the end of the central display and immediately obvious as soon as you walked in the door and an enormous plant which was placed at the left of the stage — and it was this stunning specimen which received the Bill Murdoch Prize for the Best Cultivated Epiphyte. (I heard that Neil demolished part of his fence and made a new, wider gate in order to get this plant to our show. That's true dedication!!!).

Helen Richards captured the Phil Mims Prize for Best Cultivated Terrestrial for her *Caladenia longicauda* (Plate 33), a spectacular spider orchid from Western Australia.

The prize for the Best Hybrid went to Bruce Harris for his delightful *Dendrobium* Kathryn Banks (Plate 34).

The following were considered worthy of Cultural Certificates:–

Neil and Fay Allsion for *D.* Star of Riverdene and *D. tetragonum.*
Lidy and Frans Beukelman for *D. falcorostrum.*
Peter Branwhite for *Diuris abbreviata, D. alba* and *Thelymitra nuda* 'Albury'.
Ted and Marg Elgood for *Dendrobium tetragonum.*
John Evans for *D.* Aussie Cascades X *striolatum* and *D. pugioniforme.*
Stand Harper for *D.* Bardo Rose.
Stan Hill for *D. linguiforme.*
Leon Irwin for *D. kingianum* 'Albert West' X 'Krakatoa'.
Doug Lee for *D. speciosum* (yellow) and *Plectorrhiza tridentata.*
Helen Richards for *Caladenia rigida.*
Malcolm Thomas for *Pterostylis chaetophora.*

A lot of time and effort went towards making this show a success and we thank everyone who offered their assistance and benched their precious plants which so delighted the public. ✽

A.N.O.S. INC., PORT HACKING GROUP
2nd *Sarcanthinae* Show

Robert Napier

Port Hacking Group's Second *Sarcanthinae* Show was held on 31st October at Heathcote. A new venue may have a bearing on the disappointing lack of visitors — not so much passing traffic, our inability to get free plugs from local newspapers, a street sign blowing over and an unlucky number (thirteen) of entrants.

A total of 194 plants were benched, Murray Smith (Central Coast Group) made it all the way from Wyoming, N.S.W. with 20 plants arriving about 15 minutes before the entries closed. Seventeen classes and the winners were Neville Roper, Col Brandon, Bruce Smith, Murray Smith, Kevin Wilson, Grant Wood, Dennis Wood, Dave Curry and myself (only by masquerading as a novice).

Champion of the show was a seedling *Sarcochilus hartmannii* 'Roberta' (Plate 29) of Neville Roper's, which was also nominated for a Bill Murdoch Trophy.

Amongst the plants which really stood out, in Class 8: 1st Col Brandon's *S.* Fitzhart and 2nd Dave Curry's *S.* Melody X *S.* Fitzhart, the plants looked like twins with nicely rounded petals and fairly intense colour in the centre.

Murray Smith deserved his win of Best Terrestrial orchid with his *Phaius tankervilliae* the only entry in its class, arriving at Heathcote in pristine condition.

Sadly Col Brandon's *Sarcochilus* Melba X *S.* Fitzhart, did not, in the judges' eyes, warrant a prize certificate, but it would probably have won a popular vote for champion because of its large number of round white flowers.

The results were:–

- Best *Sarcochilus hartmannii*
  - 1st: D. Wood; 2nd: N. Roper
- Best *Sarcochilus fitzgeraldii*
  - 1st: K. Wilson; 2nd: N. Roper
- Best *Sarcochilus falcatus*
  - 1st: M. Smith; 2nd: B. Smith
- Best Other *Sarcanthinae* Species
  - 1st and 2nd: D. Wood both *S. ceciliae*
- Best *Sarcanthinae* Hybrid with *S. hartmannii* parentage
  - 1st: B. Smith (*S.* Melody); 2nd: B. Smith (*S.* Weinhart X *S.* Fitzhart)
- Best *Sarcanthinae* Hybrid excluding *S. hartmannii* parentage
  - 1st: M. Smith (*Parachilus* Frances X *Sarcochilus fitzgeraldii*); 2nd: B. Smith (*Parachilus* Frances)
- Best *Sarcanthinae* Species (Seedling)
  - 1st: N. Roper (*Sarcochilus hartmannii*) 'Roberta'; 2nd: N. Roper (*S. hartmannii*)
- Best *Sarcanthinae* Hybrid (Seedling)
  - 1st: C. Brandon (*S.* Fitzhart); 2nd: D. Curry (*S.* Melody X *S.* Fitzhart)
- Best *Sarcochilus* Melba
  - 1st: C. Brandon; 2nd: D. Curry
- Best *Sarcochilus* Lois
  - 1st: C. Brandon; 2nd: B. Smith
- Best *Dendrobium* Species
  - 1st: N. Roper (*D. fleckeri*); 2nd: N. Roper (*D. jonesii*)
- Best *Dendrobium* Hybrid
  - 1st: N. Roper (*D.* Mini Pearl); 2nd: S. Griffiths (*D.* Ella Victoria Leaney X *D.* King Leaney)
- Best Terrestrial orchid
  - 1st: M. Smith (*Phaius tankervilliae*)
- Best Orchid not elsehwere included
  - 1st: R. Napier (*Cymbidium* Little Black Sambo); 2nd: N. Roper (*Cadetia taylori*)
- Best Novice *Sarcanthinae*
  - 1st: R. Napier (*Sarcochilus* Pinky) (Plate 30); 2nd: R. Napier (*S. hartmannii*)
- Best Novice *Dendrobium*
  - 1st: R. Napier (*D. lichenastrum*)
- Best Orchid exhibited by a Junior
  - 1st: Grant Wood (*Sarchochilus* Pinkhart); 2nd: G. Wood (*Dendrobium monophyllum*).

Our visiting exhibitor drew the raffle and won it for his mother whose birthday fell on the next day, congratulations Mrs Smith.

As usual our A.N.O.S. judges deserve thanks for giving us their time and expertise in ensuring a successful show. ✻

A.N.O.S. NEWCASTLE GROUP
Sarcanthinae Show

Russell Smith

The Newcastle Group held their Annual *Sarcanthinae* Show at Lake Macquarie Fair, Mount Hutton from the 16th to the 18th October, 1993 (Plate 31).

It was a great show, over 200 plants were benched. Our show is growing each year. I am not a Sarc. enthusiast, I started growing these "miniature Vandas" in the past 18 months or so; I was impressed with the quality of the orchids on display. The public expressed considerable interest in the show, the keener ones asked many and varied questions and enjoyed a good purchase at the sales table. I feel this is what shows are about, displaying plants to the public, making them aware that Australian orchids are second to none.

A very successful show and a fun time was had by all.

Below is a list of the Champion plants and their owners:–

Champion Native Species –
  Dendrobium semifuscum: Ossie Murray
Champion *Sarcanthinae*
  Sarcochilus Pinkhart X *Parachilus* Riverdene 'Holly': Murray Smith
Champion Deciduous Terrestrial
  Diuris punctata: Len Field
Champion Specimen
  Sarcochilus Fitzhart: Lance Allen ✻

A.N.O.S. SYDNEY GROUP
11th Annual *Sarcanthinae* Show

Michael Harrison
President, A.N.O.S. Sydney Group Inc.

I must admit that by the time our Sydney Group *Sarcanthinae* Show is over each year, I am sick and tired of orchid shows. That's not to say I don't enjoy the show season, it's just that from mid-August until nearly the end of October, it seems there is a never-ending series of show commitments; going to shows, judging at shows and participating in shows. But, I guess we back up year after year for more of the same, so it must be that the rewards outweigh the irritations.

In retrospect, it is always the good things we remember from each season, not the problems and 1993 was no different. We saw some marvellous plants and shared some enjoyable times, not to mention the fact that our shows continue to gain in public popularity.

It is hard to believe that 1993 was the eleventh time we have conducted the *Sarcanthinae* Show, for it seems just a few short years ago that the Committee of the Group decided to run a late spring show "just to see how it would go". The rationale, of course, was to provide exposure for those species and hybrids which flower towards the end of spring, in particular many of the *Sarcochilus* and related genera. Sure, we had out problems, but they were overcome with a minimum of fuss and bother and not only have our Sarc. Shows gone from strength to strength, a number of other A.N.O.S. Groups have picked up on the idea as well.

The 11th A.N.O.S. Sydney Group *Sarcanthinae* Show was held at Baulkham Hills Community Centre on Sunday, 24th October and again it was a superb display of the finest native orchid species and hybrids. The weather was fine and warm and the atmosphere in the hall was one of friendship and good-natured competition. The members gave unstintingly of their time and energy and with the number who kept wandering in with snack packs, chicken fillet burgers and the like, I think the KFC outlet across the road should have paid us a commission on their takings for that day.

Champion Native Orchid Species was awarded to Ferg and Nola Martin for their outstanding plant of *Peristeranthus hillii* (Plate 35). This plant carried 10 inflorescences and although the individual flowers are only 5–6mm tall, the overall effect of a mature plant in full bloom, with hundreds of flowers displayed on pendulous racemes, is striking. *P. hillii* is not an easy species to grow and is not commonly seen in cultivation. However, Fergie has had his plant for many years and it continues to thrive under his care and conditions, growing on a natural cork slab in an unheated fibreglass house.

Another very fine species was Roger Phillips' *Dendrobium discolor* 'Loren'. Carried on long arching inflorescences, the flowers are orange/brown in colour, quite large and have a very regular, symmetrical shape for an antelope orchid.

Eric Webeck brought in his beautiful *Cymbidium canaliculatum* 'Melba' HCC/ANOS. With its claret flowers on long, pendulous racemes, it is always a sight to behold. Other notable plants were a first flowered seedling of *Phalaenopsis amabilis*, well established on a totem of soft tree-fern, some very good line-bred *Sarcochilus hartmannii* and a number of plants of the so-called "large white" form of *S. falcatus*, which always flowers about four weeks later than the regular form.

Champion Native Orchid Hybrid went to Mike Harrison for a plant of *S.* Heidi (Plate 32), produced from the *S.* Fitzhart 'The Zebra' X *S. hartmannii* 'Kerri' AM/AOC line. Well established in a 125mm pot, it carried six inflorescences with just about every flower fully open. There have been some very good plants from this particular cross, made by Phil Spence quite a few years ago now. The flowers are large, round and crystalline white, with varying amounts of bright pink in the centre. They are carried on arching, upright inflorescences and the plants are generally very floriferous.

As usual, there were quite a number of *S.* Weinhart benched (*S.* Weinhart = *S. hartmannii* X *S. weinthalii*), as evidenced by the need to have a special section for them alone. *S.* Weinhart is always a pleasing hybrid, due mainly to the multitudes of flowers it produces, often from only quite small plants. The spotting on the face of the flowers is due to the influence of *S. weinthalii*. This characteristic is clearly dominant and is a feature of all *S. weinthalii* hybrids, even secondary hybrids. Darryl Smedley benched a couple of very nice *S.* Peach Spots (*S. fitzgeraldii* X *S. weinthalii*) and Sid Batchelor's *S.* Cherie's Wine (*S.* Cherie X *S. weinthalii*) was lovely with its muted tones of cream overlayed with soft brown spotting.

This year, it seems, we had fewer of the "novelty" *Sarcanthinae* hybrids on show and more of the "classic" hybrids such as *S.* Melba, *S.* Fitzhart, *S.* Lois, *S.* Heidi, etc. From a judge's viewpoint, I find it hard to go past the classic style in *Sarcochilus* hybrids. Whilst "novelty"* hybrids are interesting and often produce marvellous colours and colour combinations, they unfortunately fall down in the areas of shape and size. In time, these problems may be rectified with further careful breeding, to bring these new colours into mainstream hybrid styles without compromising shape, but for the present they remain novelties.

Eric and Jim Smith produced Champion Specimen Plant of the Show with a lovely potful of *S. hartmannii*, very well grown and flowered. It was a credit to their cultural techniques.

All things considered, the 1993 *Sarcanthinae* Show was once again a great success and the members of A.N.O.S. Sydney Group can feel justly proud of their achievements.

* "Novelty *Sarcanthinae* Hybrid" is a term used loosely to describe intergeneric hybrids between *Sarcochilus* and various other genera such as *Plectorrhiza*, *Rhinerrhiza* and *Parasarcochilus.* Certain hybrids within *Sarcochilus* exclusively may also be described as "novelty". It refers not so much to specific parentage, but to the shape and size of the resulting hybrid floral forms. "Novelty" Sarc. hybrids generally produce relatively small flowers, often no larger than 15mm tall, with somewhat narrow segments and irregular shape.
In recent times these hybrids have rightly become quite popular with native orchid growers, as they often produce attractive flowers with interesting shapes and colours. *Parachilus* Perky and *Plectochilus* Kilgra are examples of good quality "novelty" hybrids with the potential for further improvement of hybrid lines.

IRA BUTLER TROPHY COMMITTEE

Ruth Rudkin
18 Lyle Avenue,
Lindfield, N.S.W. 2070

CHAMPION AUSTRALIAN NATIVE ORCHID SPECIES OF THE YEAR

BILL MURDOCH TROPHY

Pterostylis taurus from Nesbitts Orchids (Plate 36)

This was the Champion Australian Native Orchid Species of the Orchid Club of South Australia's Winter Show. It was an even potfull of 79 flowers with average height of 20cm. They were a highly tinged red with whitish heavy veining and a good size for the species, 15mm horizontally and 29cm vertically, beautifully grown. The description of the plants by the Show Marshall was amply borne out by the three slides accompanying the nomination from which the Committee made its judgement.

As this was the first year of the Bill Murdoch Trophy the Ira Butler Trophy Committee felt satisfied with the 14 entries. Of the A.N.O.S. Groups and associated Native Orchid Societies, nominations were only received from those in the Sydney area, nine in all. Nominations were received from the following State Orchid Societies: The Orchid Club of S.A. (2), the Orchid Society of N.S.W. (1) and the Tasmanian Orchid Society (1). The nomination of a potfull of *Pterostylis baptistii* from the Orchid Society of W.A. arrived the day after judging, which was a shame.

The idea for a trophy for the Champion Australian Native Orchid Species of the Year was first suggested by a one-time member of the Ira Butler Committee. Then before anything was done we received a request from the Newcastle A.N.O.S. Group for just such a trophy to honour the late Bill Murdoch, who had been very active in native orchid circles for many years. Behind the move was the idea that the line breeding of species should be encouraged, to make the species more attractive and to discourage growers from taking species from the bush.

It does so happen that there was one entry for which the breeding was given, Ken Russell's *Sarcochilus hartmannii* 'BH.EM No. 1' X 'BK Redspot'. This was Grand Champion of Maribyrnon Orchid Society's *Sarcochilus* Festival and was grown by Eric and Frances Wilde. We expect more like this in the future.

The number of genera entered was refreshing. There were five terrestrials of which two were *Pterostylis* species, two were *Caladenia* species and a good potfull of *Glossodia major* from the Tasmanian Orchid Society. From the *Sarcanthinae* subtribe there were two *Sarcochilus hartmannii*, a *Plectorrhiza tridentata* and a *Peristeranthus hillii*. Of the genus *Dendrobium* there were three *D. speciosum* and a most floriferous *D. canaliculatum*.

It is now up to all species growers to encourage your Society or Native Orchid Group to have a section in your shows for our Native Orchid Species in 1994. Encourage your Show Marshall to enter your Champions.

CHAMPION AUSTRALIAN NATIVE ORCHID HYBRID OF 1993

Gold Trophy won by R. Findlater for

***Dendrobium* Star of Riverdene 'Amanda'** HCC/ANOS (Plate 37)

This was one of Sid Batchelor's hybrids. It was a well-grown plant with eleven attractive pseudobulbs giving eight upright and arching inflorescences. There were up to 23 bright gold flowers per inflorescence, well spaced along the rachis and well presented to the viewer. The flowers were star-shaped with wide segments and good substance and texture. When viewed side on, the flowers were almost flat with petals only slightly coming forward. The labellum was flat and spade-shaped, pale yellow in colour with reddish markings deep within it. The measurements, 50.5mm horizontally and 59.8mm vertically gave an indication as to the size of the average flower. This description was given on the nomination form and these qualities were well displayed by the three slides included with the form.

The judging was difficult this year with 29 plants to choose from. Nine A.N.O.S. Groups and Native Orchid Societies nominated a total of 11 plants from their shows. These will receive Silver Trophies. A.N.O.S. Council nominated two awarded plants, one of which gained the Gold Trophy above. The three State Orchid Societies nominated six plants from their State Shows and these too will receive Silver Trophies. The Orchid Society of N.S.W. nominated six awarded plants and Queensland one from the Far North Coast, Nambour. These do not get a Silver Trophy.

What was pleasing were the nominations from local orchid societies affiliated with their local State Societies. These were Bankstown, Manly-Warringah in N.S.W. and Burnie in Tasmania. They will receive Silver Trophies. The most unfortunate were the three nominations from the Orchid Society of W.A. and one from Maribyrnong, Victoria, all very good, which arrived after the due date and missed the judging.

The average quality was even better this year with many nominated plants coming from keen hybridists. The hybridists given were: Sid Batchelor (5), Neil Finch (4), Ken Russell (2), Wal Upton (2), Col Brandon (2), Neville Roper (1) and Phil Spence (1), 17 in all out of 29 submitted. This was the original aim of the Ira Butler Trophy Committee, to encourage the breeding of desirable hybrids and in this way to discourage growers from taking native species from the bush. Congratulations to you all.

Editor's Note and some recently awarded native orchids

I am unable to print any other photographs of the Ira Butler Trophy winners for 1993. When requesting these from the Ira Butler Trophy Committee, I was advised "that only photographs of the winning plants of the Ira Butler and Bill Murdoch Trophies be sent at this time to magazines for publication". I was not sent a list of the nominations.

However, David Banks has sent me photos of some of the latest A.N.O.S. awarded native orchids, included in which was *Dendrobium Xsuperbiens* 'S.B.' HCC/ANOS (Plate 41), I also include a photo of *Dendrobium* Elegant Lace 'Kariong' HCC/NSW (Plate 42) both were included in the I.B.T. nominations this year.

The other A.N.O.S. awarded plants photographed by David Banks are:–

Plate 38: *D. canaliculatum* 'Musgrave Mustard' AD/ANOS. Owned by Darryl Smedley.

Plate 39: *D. kingianum* 'Boundary King' AD/ANOS. Owned by David Butler. Bush Clone from near Coffs Harbour, collected by Pat King. Very large labellum.

Plate 40: *D.* King Wong 'Striker' AD/ANOS. Owned by Norm Mitchell. Bred by Reg Sheen. Reserve Champion at Second A.N.O.S. Conference.

IRA BUTLER TROPHY CHAMPIONS

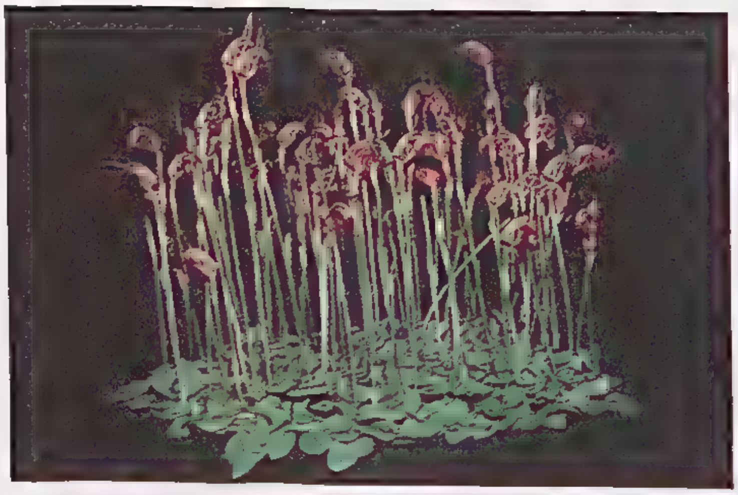

Plate 36: *Pterostylis taurus.* Photo: D. Titmuss

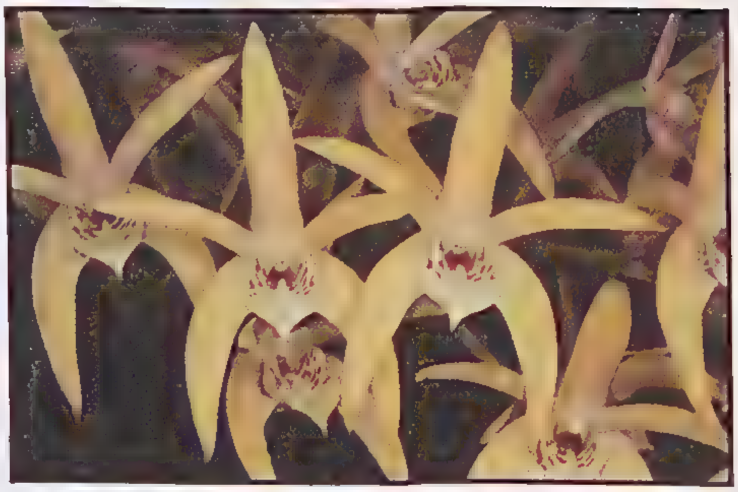

Plate 37: *Dendrobium* Star of Riverdene 'Amanda'. Photo: D. Titmuss

RECENT AWARDED ORCHIDS

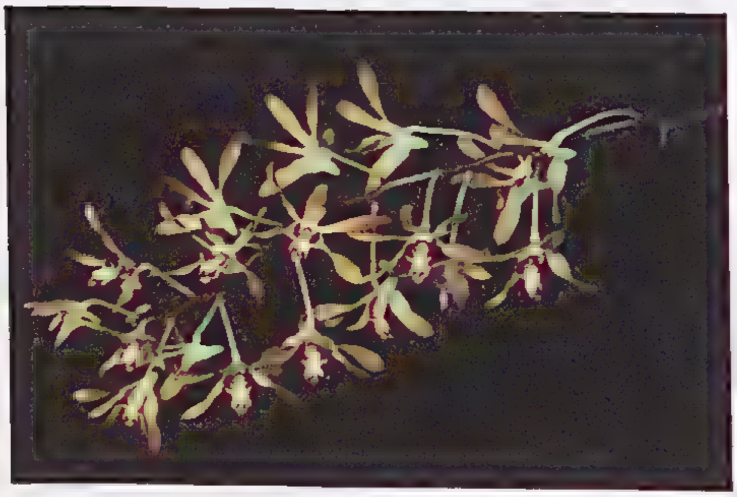

Plate 38: *Dendrobium canaliculatum* 'Musgrave Mustard' AD/ANOS. Photo: D. Banks

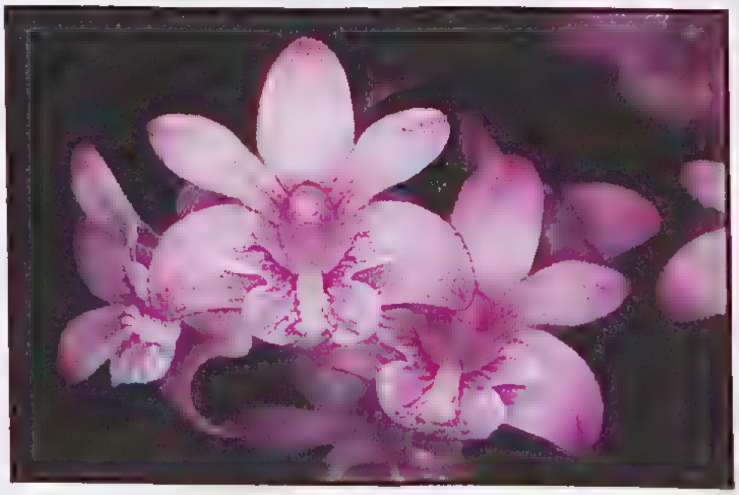

Plate 39: *Dendrobium kingianum* 'Boundary King' AD/ANOS. Photo: D. Banks

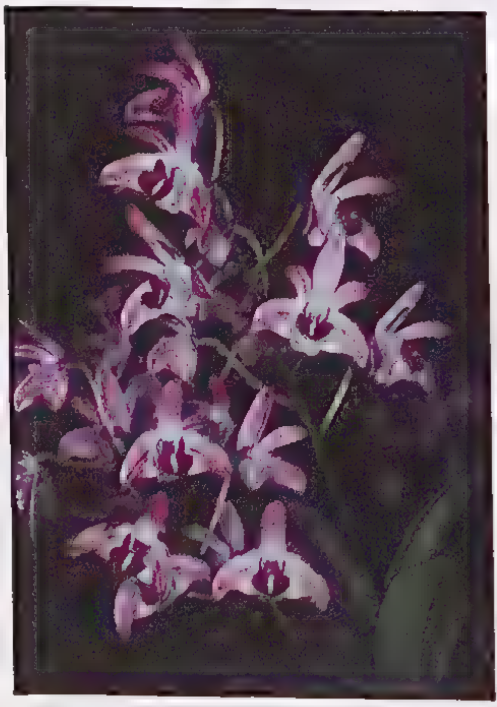

Plate 40: *Dendrobium* King Wong 'Striker' AD/ANOS. Photo: D. Banks

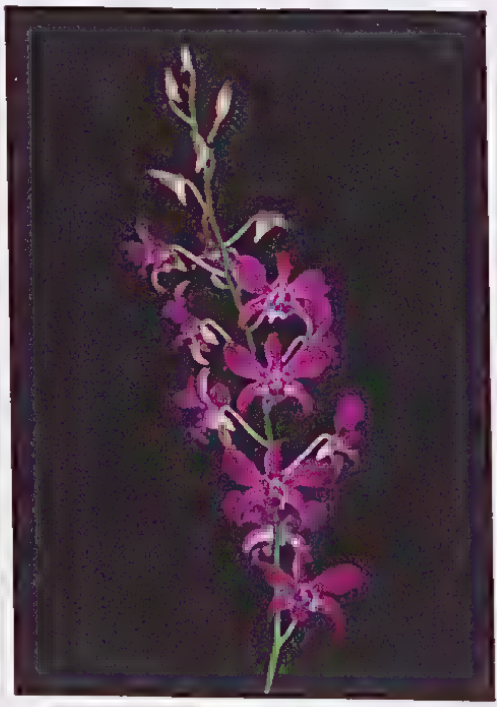

Plate 41: *Dendrobium* X*superbiens* 'S.B.' HCC/ANOS. Photo: D. Banks

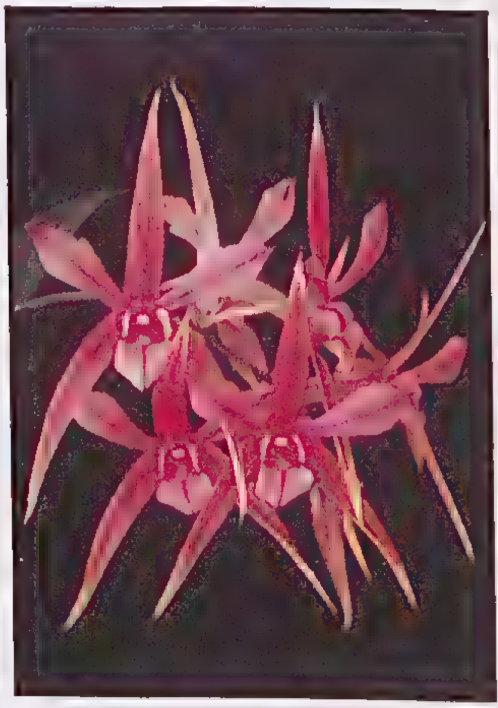

Plate 42: *Dendrobium* Elegant Lace 'Kariong' HCC/NSW. Photo: W. T. Upton

Reprinted from: Muelleria 8(1): 69–72 (1993)

THE STATUS OF RECENTLY NAMED ORCHIDS FROM SOUTH-EASTERN AUSTRALIA

MARK A. CLEMENTS*

ABSTRACT

Clements. Mark A. The status of recently named orchids from south-eastern Australia. ***Muelleria* 8(1): 69–72 (1993).** — The status of orchid taxa described in two recent publications is determined based on a study of the types. *Caladenia formosa* G.W. Carr. *C. flavovirens* G.W. Carr. *C. fulva* G.W. Carr. *C. venusta* G.W. Carr, *C. verrucosa* G.W. Carr, *C. versicolor* G.W. Carr and *Gastrodia procera* G.W. Carr are respectively conspecific with the following which are here reduced to synonymy; *Caladenia haemantha* D. Jones, *C. beaugleholei* D. Jones, *C. demissa* D. Jones, *C. floribunda* D. Jones, *C. rigens* D. Jones, *C. aerochila* D. Jones and *Gastrodia entomogama* D. Jones. *Caladenia dilatata R. Br.* subsp. *villosissima* G.W. Carr, *C. montana* G.W. Carr, *C. oenochila* G.W. Carr, *C. simulans* G.W. Carr and *Chiloglottis grammata* G.W. Carr are conspecific with and here respectively reduced to synonyms of *Caladenia tentaculata Schldl.*, *C. fitzgeraldii* Rupp, *C. lindleyana* (H.G. Reichb.) M. Clements & D. Jones, *C. dilatata* R. Br. and *Chiloglottis gunnii* Lindley.

INTRODUCTION

In 1991 one hundred and thirty new names for Australian orchids were published in two separate publications. In February 1991 Carr published new names for twenty two taxa in the genera *Caladenia*, *Chiloglottis* and *Gastrodia* from Victoria in a publication entitled 'Indigenous Flora and Fauna Association Miscellaneous Paper No. 1 (1991)' (Carr 1991). Two months later the descriptions of one hundred and eight new species and natural hybrids in the genera *Acianthus*, *Arthrochilus*, *Caladenia*, *Chiloglottis*, *Corybas*, *Dipodium*, *Diuris*, *Gastrodia*, *Genoplesium* and *Prasophyllum*, from all over the continent, were published by Jones in the second volume in the monographic series 'Australian Orchid Research' (Jones 1991). The contrast in presentation between these two publications is enormous.

Carr's publication contained the names of the new taxa, a brief Latin diagnosis, a type citation, a list of representative specimens examined, distribution, notes, conservation status and etymology sections. There are no botanical descriptions for any of the new taxa and only one is illustrated, that on the front cover of the publication. By comparison, the paper by Jones consisted of the full descriptions, a Latin diagnosis, a type citation and illustration of all taxa, and in some cases colour plate of the new species. Irrespective of these differences in presentation, study of the texts reveals that a number of species have apparently been described by both authors.

VALIDITY OF THE PUBLICATIONS AND TAXA

In accordance with the relevant articles of the International Code of Botanical Nomenclature (ICBN) both publications are valid and meet the requirements as places for the publication of new plant names. In both cases the new names contained within have been validly published although in the case of Carr's paper, only the minimum needed to validate a new name has been provided. There are also many factual and orthographic errors throughout the Carr text and two names, *Caladenia formosa* and *C. parva*, are missing from the abstract. The

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meagre descriptions and lack of illustrations make it difficult for anyone, without access to the types, to determine accurately the correct application of these new names.

Despite its shortcomings, Carr's publication predates that of Jones by two months, so where the same species was described by both authors, Carr's name has priority. The purpose of this paper therefore is to enunciate the status of Carr's taxa and to determine which of the species described by Jones (1991) and other authors are affected by his work.

TAXONOMY

Caladenia australis G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 2–3 (8 Feb 1991). *Caladenia reticulata auct. non* Rupp: Nicholls, Orchids Aust. 67, t. 250 (1969).

Caladenia dilatata R. Br., Prod. 325 (1810). Type: 'Port Dalrymple', *R. Brown s.n.* (lectotype specimen (a) BM!). Notes: A recent re-examination of the type of *Caladenia dilalata* R. Br. plus comparison with fresh material from Tasmania has confirmed that Brown's name should be correctly applied only to a late flowering species with restricted distribution in Tasmania and southern Victoria. *C. simulans* and *C. corynepetala* are undoubtedly the same species and accordingly are here reduced to a synonym of *C. dilatata*. Clarification of the status of *C. dilatata* is the subject of another paper (Clements and Jones in prep).

[*Caladenia simulans* G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 14–15 (8 Feb 1991), **syn. nov.**].

[*Caladenia corynepetala* D. Jones, Aust. Orch. Res. 2: 22–23, f. 24, t. (1991), **syn. nov.**]

Caladenia dilatata R. Br. subsp. *villosissima* G.W. Carr = *Caladenia tentaculata* Schldl.

Caladenia fitzgeraldii Rupp, Victorian Naturalist 58: 199 (1942).

[*Caladenia montana* G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 4 (8 Feb 1991). **syn. nov.**] Notes: I have examined a number of collections of *Caladenia fitzgeraldii* from New South Wales and the ACT, including material collected from near the type site near Bathurst, and compared them with the type of *C. montana*. The two taxa are without doubt conspecific and *C. montana* is accordingly here reduced to a synonym of *C. fitzgeraldii*.

Caladenia formosa G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 4 (8 Feb 1991). Notes: Carr compares his new species with *C. patersonii* R. Br. and stated that it 'differs in being more robust with wholly dark reddish-purple flowers which are larger in all parts'. In fact there is overlap in size of flowers of these two species but the distinguishing features are clearly defined and illustrated by Jones under *C. haemantha*. *C. formosa* is actually more closely allied to *C. concolor* Fitzg. and has been interpreted as that species until the present.

[*Caladenia haemantha* D. Jones, Aust. Orch. Res. 2: 26, t., f. 29 (5 April 1991), **syn. nov.**]

Caladenia patersonii R. Br. var. *concolor auct. non* Fitzg.: J. Weber & R. Bates in Jessop & Toelken, Flora South Aust. Part IV: 2072 (1986).

Caladenia flavovirens G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 4–5 (8 Feb 1991). Notes: Previously confused with *C. pallida* Lindley; recent field studies have confirmed that *C. beaugleholei* D. Jones is synonymous (J. Jeanes pers. comm.).

[*Caladenia beaugleholei* D. Jones, Aust. Orch. Res. 2: 16–17, f. 16 (5 April 1991), **syn. nov.**]

[*Caladenia pallida auct. non* Lindley: Nicholls, Aust. Orch. t. 256 (1969).]

Caladenia fragrantissima D. Jones et G.W. Carr subsp. **orientalis** G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 6–7 (8 Feb 1991).

Caladenia arenaria auct. non Fitzg.: Nicholls, Vic. Nat. 56: 123–124, f. (1939); *Caladenia patersonii* R.Br. var. *arenaria* (Fitzg.) Nicholls, Vic.Nat. 59: 189 (1943).

Caladenia fulva G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 7–8 (8 Feb 1991). Type: 'Ironbark Reserve near Stawell, 37° 45′S., 143° 07' E., Victoria, Victorian plant grid J2, 16.x.1989, *P. Branwhite s.n.* (holotype: MEL; isotype CBG)'. Notes: The type of this species has never left ANBG (CBG) since being collected by Peter Branwhite and forwarded to Canberra. Carr, who has never seen the type, gave virtually identical collection details to those provided by Jones in a manuscript of his 1991 paper sent to MEL in November 1990. The two type citations are quoted here for the purpose of comparison.

[*Caladenia demissa* D. Jones, Aust. Orch. Res. 2: 24, t., f. 26 (5 April 1991). Type: 'Victoria; Ironbark Reserve, near Stawell, 37° 45′S, 143° 07′E, 16 October 1989, *P. Branwhite s.n.* (holo CBG; iso CBG, MEL).', **syn. nov.**]

Caladenia insularis G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 7–8 (8 Feb 1991).

Caladenia lindleyana (H.G. Reichb.) M. Clements & D. Jones, Aust. Orch. Res. 1: 27 (1989).

Caladenia patersonii R. Br. var. *lindleyana* H.G. Reichb., Beitr. Syst. Pflanzenk. 66 (1871); *Caladenia filamentosa auct. non* R. Br.: Lindley, Gen. sp. orchid. pl. 421 (1840).

[*Caladenia oenochila* G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 11–12 (8 Feb 1991), **syn. nov.**] Note: The spreading habit of the lateral sepals and petals, narrowing labellum apex, and sigmoid calli in four rows and general yellow background colour of the flower with a red labellum, are all characters that readily identify *C. lindleyana* from its close ally *C. patersonii* R. Br. These are the same characters found in *C. oenochila* and therefore there can be no doubt that the species described by Carr is conspecific with *C. lindleyana* (D. Jones pers. comm.).

Caladenia lowanensis G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 9–10 (8 Feb 1991). Notes: One of the most distinctive species from the *C. reticulata* Fitzg. group named by Carr and at present known only from one site in the Victorian mallee.

Caladenia montana G.W. Carr = *Caladenia fitzgeraldii* Rupp

Caladenia oenochila G.W. Carr = *Caladenia lindleyana* (H.G. Reichb.) M. Clements & D. Jones

Caladenia parva G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 12–13 (8 Feb 1991).

Caladenia robinsonii G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 13–14 (8 Feb 1991).

Caladenia simulans G.W. Carr = *Caladenia dilatata* R. Br.

Caladenia tensa G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 15–16 (8 Feb 1991). Notes: A poorly understood species the existence of which has long been known in South Australia. It is one of a number of species within the *C. tentaculata* Schldl. complex.

Caladenia tentaculata Schldl.,Linnaea 20: 571 (1847). Type: 'Lofty Range', *O.* Behr ex herb. *W. Sonder s.n.* (holo ?B+; lectotype specimen (41b) K-L! vide Clements, 1989).

[*Caladenia dilatata* R. Br. subsp. *villosissima* G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 3–4 (8 Feb 1991), **syn. nov.**] Notes: Carr compares this taxon with *C. dilatata* and makes the comment that it may be difficult to distinguish them apart in some instances. *Caladenia dilatata* subsp. *villosissima* however shares features with several species within the *C. dilatata* complex and indeed is inseparable from *C. tentaculata* Schldl. *sens. lat.* and is accordingly here reduced to a synonym of it.

Caladenia thysanochila G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1):

16–17 (8 Feb 1991). Notes: Despite the fact that this species is currently only known from two plants it does appear to be distinct from all others in the genus and warrants the status it has been allocated pending further investigation.

Caladenia venusta G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 17–18 (8 Feb 1991).
[*Caladenia floribunda* D. Jones, Aust. Orch. Res. 2: 25–26, f. 28 (5 April 1991), **syn. nov.**].

Caladenia verrucosa G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 18–19, t. (8 Feb 1991).
[*Caladenia rigens* D. Jones, Aust. Orch. Res. 2: 32, t., f. 38 (5 April 1991), **syn. nov.**].

Caladenia versicolor G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 19–20 (8 Feb 1991).
[*Caladenia aerochila* D. Jones, Aust. Orch. Res. 2: 13, t., f. 13 (5 April 1991), **syn. nov.**].

Gastrodia procera G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 22–23 (8 Feb 1991).
[*Gastrodia entomogama* D. Jones, Aust. Orch. Res. 2: 63, t., f. 82 (5 April 1991), **syn. nov.**].

Chiloglottis grammata G.W. Carr = *Chiloglottis gunnii.*

Chiloglottis gunnii Lindley, Gen. Sp. Orchid. Pl. 387 (1840).
[*Chiloglottis grammata* G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 20–21 (8 Feb 1991), **syn. nov.**] Note: Carr's taxon is without doubt conspecific with *C. gunnii* Lindley *sens. str.* and is here reduced to a synonym of it (D. Jones pers. comm.).

Chiloglottis platychila G.W. Carr, Indig. Flora & Fauna Assoc. Misc. Pap. (1): 21–22 (8 Feb 1991).

CONCLUSIONS

Of the 21 names published by Carr, eight affect the work of Jones and these have been reduced to synonymy of Carr's species. In addition, five taxa described by Carr are conspecific with others already described elsewhere and are here accordingly reduced to synonyms of those names.

ACKNOWLEDGMENTS

The production of this paper was in part supported through funding from the Nell and Hermon Slade Trust and the Australian Orchid Foundation. I also wish to thank David Kay, David Jones, and Bob Makinson for commenting on the manuscript. I am also most grateful to Jim Ross, Acting Chief Botanist at MEL, for the loan of the relevant types.

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Clements, M.A. (1989). Catalogue of Australian Orchidaceae, *Aust. Orch. Res.* 1: 1–160.
Carr, G.W. (1991). New taxa in *Caladenia* R. Br., *Chiloglottis* R. Br. and *Gastrodia* R. Br. (*Orchidaceae*) from south eastern Australia. *Indig. Flora & Fauna Assoc. Misc. Pap.* No. 1., Melbourne.
Jones, D.L. (1991). New taxa of Australian Orchidaceae species. *Aust. Orch. Res.* 2: 1–208.

Revised manuscript accepted 22 October 1992

ORCHIDS OF BLACK MOUNTAIN, A.C.T.

Sheila Cudmore, President of the Canberra Orchid Society, who says: "I thoroughly enjoy *The Orchadian*"; sent me these pictures of some orchids she photographed, in situ, on Black Mountain, A.C.T. from September 30 through October, 1993.

In her letter she stated: "These are just some of the slides I took . . . the *Glossodia major* (Plate 47) was out beautifully after the long weekend, there were so many flowers they were like a blue carpet . . . many people I meet don't even know we have orchids growing in the A.C.T. so I thought I would try putting us on the 'Map' . . . We are hoping to have a seminar here in October, 1995 and these are some of the orchids the delegates will be able to see; the sun orchids are about a month later."

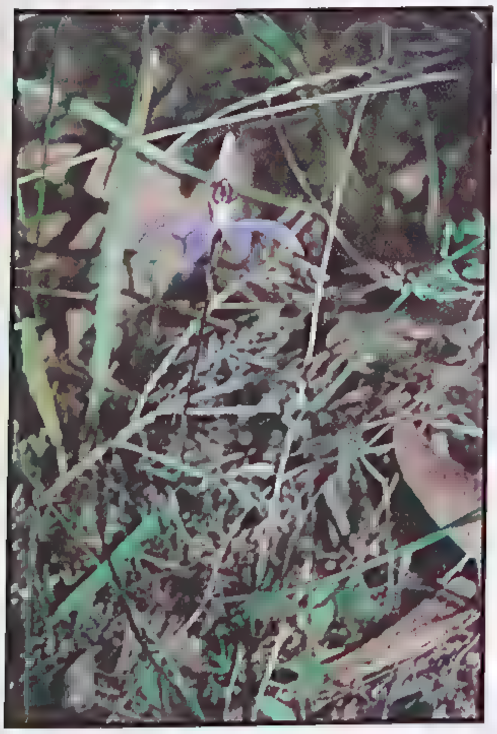

Plate 43: *Caladenia caerulea*

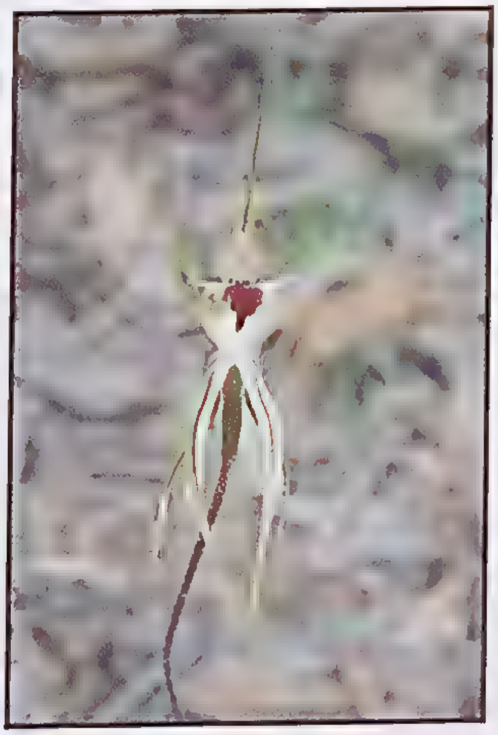

Plate 44: *Caladenia dilatata.*

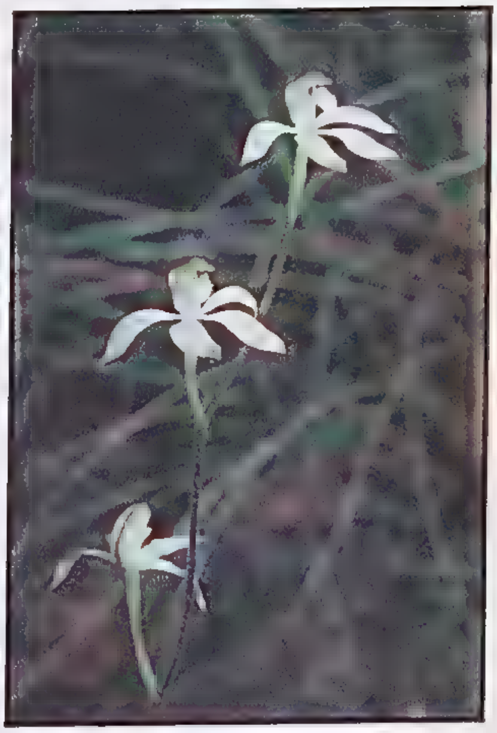

Plate 45: *Caladenia gracilis.*

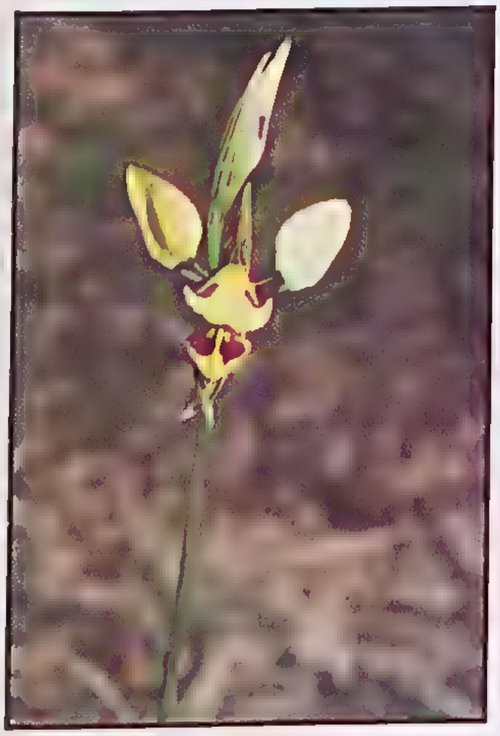

Plate 46: *Diuris sulphurea.*

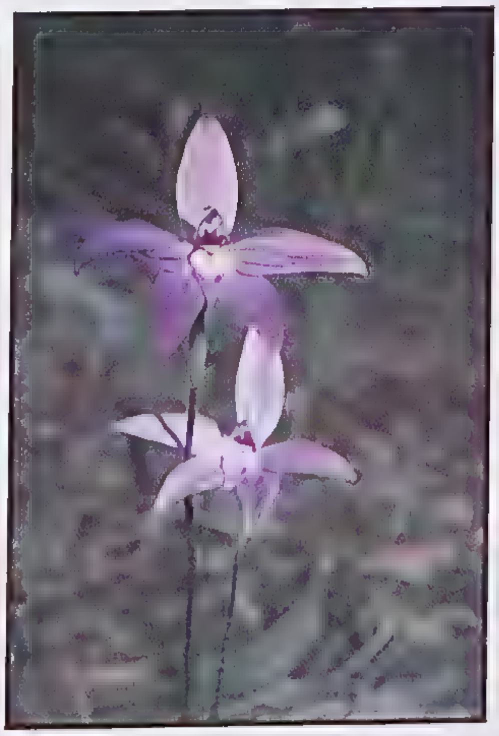

Plate 47: *Glossodia major.*

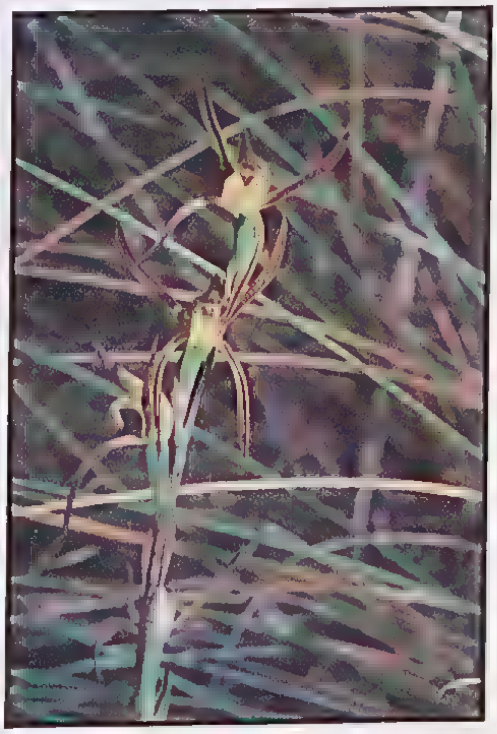

Plate 48: *Lyperanthos suaveolens.*

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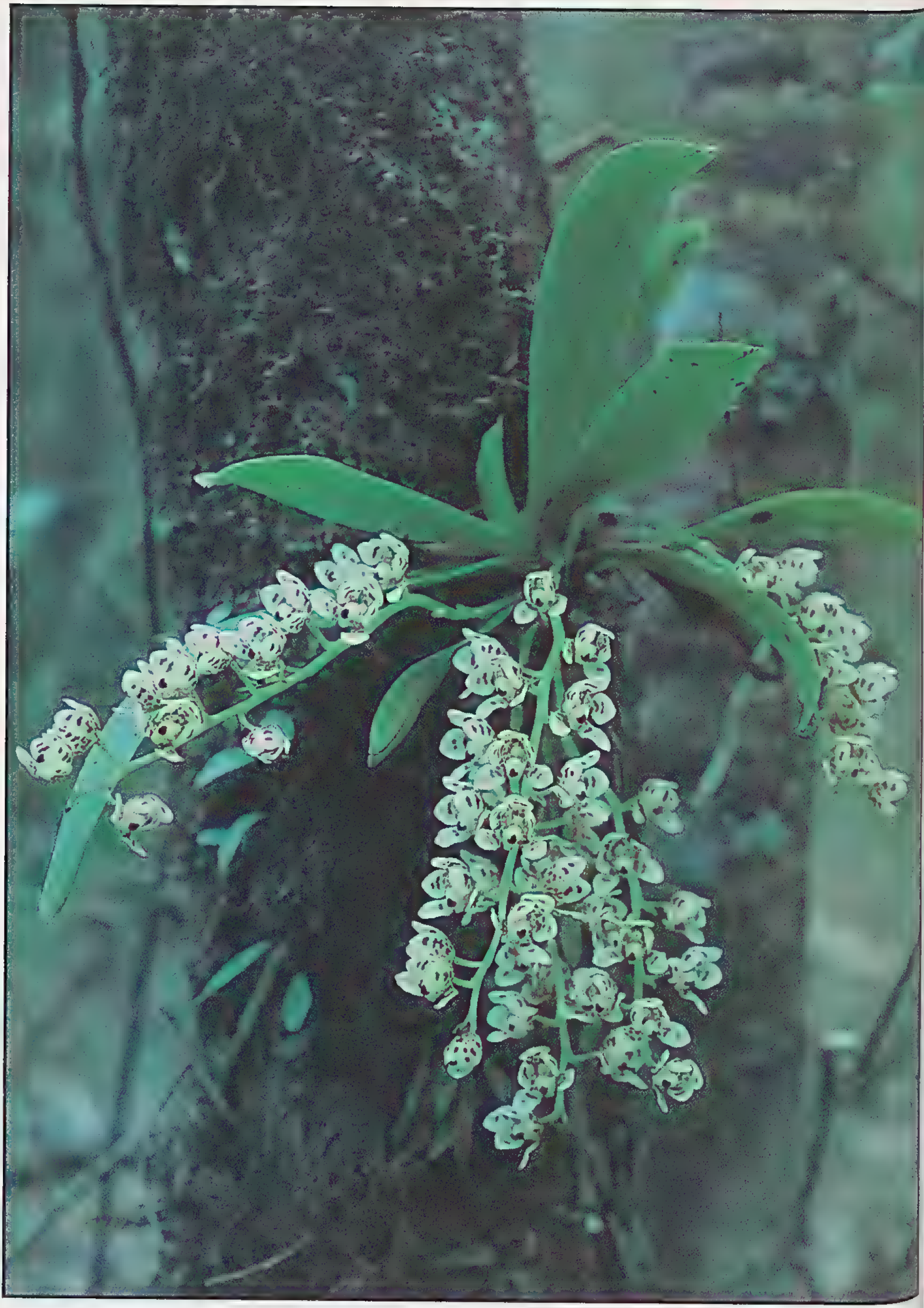

Plate 49: *Sarcochilus weinthalii* in situ Toowoomba Ranges Photo: D. Banks

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The Orchadian

Volume 11, Number 4 June, 1994

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TALKING POINT

Throughout Australia and beyond the gums ran hot, a few had me dead and buried, but after successful heart by-pass surgery I live to edit further Orchadians! I sincerely thank those who sent get well wishes.

The many contributors who had articles for me, well before this issue's deadline lessened the stress; time is precious from deadline to printers to keep *The Orchadian* on time. I have nothing but praise and appreciation for all the contributors who give of their time to benefit our readers with their thoughts, experiences and above all knowledge. Is it not wonderful that the interest in our native orchids is increasing? The general public's growing awareness is apparent in the greater attendances at shows and indeed, in the increasing number of shows and conferences. Feed back from both commercial and private growers supports this point. Expeditions to outback and unexplored areas are now regularly taking place, Kingsley Dixon's article in this issue, "Tropical Terrestrial Orchids of Western Australia", a sponsored expedition, is an example.

The great diversity of our unique native orchids is leading to much research, frequently followed by the creation of new species. More botanists today are working on our native species, this alone is creating a greater interest, particularly as many amateurs are assisting them in fieldwork, etc.

Much is being achieved on the conservation front and our groups are extremely active, I instance Bob Bates' "News from N.O.O.S.A." in this issue. Many areas are saved from destruction and the authorities made aware when orchids are endangered. We must all take part in the conservation of our precious gems; we want future generations to see them. Without our participation this, unfortunately, will not happen. Keep your eyes open for possible habitat destruction, then advise your local group or native orchid society, they will take action.

There is no need to take our native orchids out of the bush as they are readily available from a number of orchid nurseries, see our Advertisers on pages 189-191, or buy them from the sales bench at your local group meeting and at shows. The forms are generally superior to bush collected species, both epiphytes and terrestrials.

Our hybrids are also increasing our awareness, particularly the hot/cold *Dendrobium* types. We now have over 578 *Dendrobium* hybrids, nearly 100 *Sarcochilus* types and over 42 terrestrial hybrids.

The future looks bright, remember we are all guardians of the Australasian native orchid.

Walter T. Upton

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THE ORCHADIAN

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ORCHIDS OF TRINITY INLET

Paul Ormerod
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Abstract: A brief account of the ten genera and 18 species of orchids found epiphytic on mangrove in Trinity Inlet.

Trinity Inlet is a large estuary located next to Cairns city in north Queensland. Several creeks but no major river flow into it from the surrounding region which is becoming more and more suburbanised. It was once long ago the outlet of the Mulgrave River, which now shares a mouth (Mutchero Inlet or popularly Russell Heads) with the Russell River about halfway between the towns of Gordonvale and Babina.

The principal habitat for orchids in Trinity Inlet is its mangrove forests, containing a representation of nearly all Australia's mangrove species. The area surrounding this forest was mostly open woodland dominated by *Eucalyptus* and some areas of *Melaleuca* swamp forest. Much of this is now gone, converted into sugarcane farms and now housing developments.

Some of the damage to the mangrove has been the current two large refuse dumps, a failed CSR land reclamation attempt and extension of the trawler base. Furthermore, siltation of the feeder creeks and subsequently the inlet has greatly accelerated in the past 25 years. Silt has the properties to suffocate the roots of some mangrove species.

Despite the rich history Trinity Inlet has with Cairns and immediate region, very little is known of its orchid flora. Perhaps the reasons being that mangrove is often thought to be a poor environment for orchids, or that treading over soft slippery mud interspersed with numerous toe-stubbing roots with the ever present sandflies and mosquitoes may quench the appeal of further investigation.

My sporadic trips into the inlet over the past 10 years however show it to be a cool hospitable refuge in the middle of the hottest summer days for orchids and man alike. Various stands of mangrove provide a surprising versatility of habitat microclimates. Two examples are five metre tall shrubby trees (*Brugiera* sp.) festooned with lichens and moss-like plants to 10 metre tall closed canopy formed by other trees.

Most of the species enumerated below flower around late July and August, which is virtually the end of the mild north Queensland winter.

1. *Bulbophyllum baileyi* — known to me from two localities where it is colony forming.
2. *B. schillerianum* — not commonly encountered, I found it to be locally common only once. The inlet form has orange-red flowers.
3. *Chiloschista phyllorrhiza* — known to me from a few plants in one locality, much more common at Mutchero Inlet.
4. *Cymbidium madidum* — usually found as single plants, often seen around Cairns on street trees and palms.
5. *Dendrobium calamiforme* — along with *D. discolor,* the most common orchid in Trinity Inlet. Large plants in full flower make an attractive display.
6. *D. racemosum* — quite an unexpected discovery. At first I thought this was the rare natural hybrid *D.* X*foederatum,* but that is rather different in habit. *D. racemosum* may be distinguished vegetatively from *D. calamiforme* by its filamentous roots, erect habit and sulcate or grooved leaves. Two plants seen in separate localities.
7. *D. rigidum* — a reasonably common plant though often absent from some areas.
8. *D. linguiforme* var. *nugentii* — another unexpected find, I chanced upon the plant whilst lost in the mangrove with the tide rising around me. A single plant known

which has the uncommon *Robiquetia gracilistipes* as neighbour on an adjacent tree.

9. *Dendrobium lichenastrum* var. *prenticei* — not a rare plant but scattered in occurrence and must be searched for. Its many habit forms are all found in the inlet.
10. *D. canaliculatum* var. *tattonianum* — this mostly occupies mangroves on the margins next to its preferred habitat of open woodland.
11. *D. discolor* — as noted above, probably the most common orchid in Trinity Inlet.
12. *D. smillieae* — the single large plant known to me was poached by someone working the area for *D. discolor* and *D. calamiforme*. Eager searching has not revealed any more specimens.
13. *Eria fitzalanii* — about six plants known to me in one general area, possibly originating from a colony growing on a large *Dillenia alata* near my former Whiterock residence.
14. *Oberonia complanata* — hard to catch in flower and again known to me from a few plants, in this case growing on an old mossy mangrove.
15. *Plectorrhiza brevilabris* — the long aerial roots it possesses brought it to my attention. A single find only.
16. *Robiquetia gracilistipes* — two plants found, unfortunately one was later discovered killed by salt water when its branch broke and fell down.
17. *Taeniophyllum* species — an often locally common species, it seems to prefer the twigs and branchlets of *Brugiera* species. The latter have a rather smooth bark usually covered in lichens, plus an open shrubby habit which provides good light. May be distinguished externally from *Taeniophyllum muelleri* by the roots which are strongly triangular in cross-section, instead of semi-terete. It is however very similar in its inflorescence and green to yellow-green flowers. Also occurs on the Atherton Tableland. Alcohol specimens at Q.R.S. (2) and N.S.W.
18. *Thrixspermum congestum* — a single plant was found by me, but it is presumably more common than this would indicate.

That concludes the number of orchids I have found epiphytic on mangrove in Trinity Inlet. Mutchero Inlet is the next substantial inlet to the south. I haven't had as much time and occasion to explore the latter, but have happened upon *Dendrobium baileyi* and *Pholidota imbricata* (growing on *Heritiera littoralis*). Both taxa appear to be absent from Trinity Inlet. The chances for new habitat records on mangrove for orchids at Mutchero Inlet are quite good since it is in a wet area close to rainforest. ✽

A HYBRIDISER'S NARRATIVE

Neville Roper
27 Delves Street, Mortdale, N.S.W. 2223

Sometime in 1979 I began to grow native orchids. A short time ago it was difficult to buy native hybrids seedlings as there were relatively few nurseries (notably Deane's at Dural, "Double U" at Elanora Heights, Phil Spence at Newport and Yarrabin Orchids at Pennant Hills) that had any quantity of new native hybrids for sale. There were also, of course, a small number of other growers' culls to be hunted out on plant stalls at shows. These were often brought home and cherished in the false hope that someone had made a mistake and let something worthwhile escape from their collection.

Native species in the late 1970's and early 1980's were probably a little easier to obtain in an environment when "bush raping" was still widely practiced although nearing its end. Much of my pocket money was sent to coastal logging towns in New South Wales and

Queensland to pay for cartons of "freshly raped" species of all descriptions in the hope of fluking a good one. It has taken me years to dispose of the numerous plants of monotonously similar *Dendrobium kingianum* and *D. speciosum* var. *hillii.* My interest in *Dendrobium* species now centres (almost entirely) on the hybrids that they may produce rather than on their own intrinsic merit — each to his own, I guess.

This background of limited availability of native hybrids and to me, the comparative repetitiousness within each species, led me to begin hybridising in 1981. Before the species buffs begin plotting my downfall, I should point out that this is probably a reflection on the quality of the species I was growing and my own attention span.

I attempted four crosses in my first year. The only one of note was *D.* Miara *(D. falcorostrum* X *D.* Hilda Poxon*)* which was good enough to ensure my continuing interest in hybridising. These seeds were flasked using a beginner's guide to flasking, some bought media and some second-hand Kikkoman soy sauce bottles that made good, if somewhat undersized, flasks. The seeds were sterilised in filtered pool chlorine and introduced into the flasks using a hypodermic syringe. The most difficult part was buying the syringes and large gauge needles. Many, many chemists obviously thought the worst of me after asking them if they could supply syringes. My hybridising and flasking activities were kept secret at this stage because I had already been ticked off as being some kind of meddling backyarder.

After a dozen or so years further down the track my 1993 records reveal something of a contrast. Twenty-seven crosses produced pods (not all with viable seed) which were flasked in a clean air machine, onto homemade media in second-hand jam jars — some aspects have not changed! Many of the crosses show advancements too:–

D. Brolga 'Roberta' HCC/AOC/NSW crossed with Dennis Wood's *D.* Colonial Bullion 'Peachy' AM/AOC/NSW. Not only are both parents complex hybrids but they are both awarded and represent a co-operative effort by two showbench adversaries — and no longer a secret.

Many reading this have probably seen or heard very little of my hybrids and there maybe some explanation for this:–

1. I rarely exhibit at shows other than the local ones, although the Wollongong Conference and Dungog shows (I would just about walk to Dungog if I had to!) are notable exceptions.
2. Being a hobbyist my orchids compete for the precious space of a suburban Sydney backyard with a dog, aviaries and a clothes line. Rarely do I flower more than a dozen seedlings from any one cross due to the pressures of limited space. Invariably more seedlings are dumped from mother flasks than make it to the replating stage.
3. It is possible that you have seen, or even own, some of my creations without realising it. Mother flasks of many of my crosses have been given to John Mewburn and Ken Russell over recent years. They must be spreading them around a bit because a *D.* Red River 'Iris' picked up an Ira Butler nomination in Western Australia last year.

THE GRAHAM HEWITT FACTOR

I think it was Jill Upton who said to me: "I've just seen the new crosses you have registered, you must have a really good *D.* Graham Hewitt". The truthful answer is that the one I have bred with, despite winning several prizes, is a bit of a dog — but with some very redeeming features:–

- it can flower as often as three times a year, proper flushes not just the odd raceme
- it is an extremely vigorous grower
- it will carry up to 30 flowers on each raceme although it does have trouble holding them all upright
- it is quite fertile
- it transfers its red spotting to a good percentage of its progeny

- its offspring will flower early in the season when there is a little less competition.

Some of the better hybrids that this *D.* Graham Hewitt has produced are briefly outlined below:–

D. Elingaa *(X D. tetragonum* var. *giganteum)* an early cross that produced very big, spotted stars in shades varying between white and pale green. Generally the racemes have been a little short, averaging around six flowers to the raceme, but they could be used to make a decent "Hilda Poxon"-type hybrid.

D. Pinterry (Plate 1) *(X D.* Ellen 'Corinna'*)*, most of these have been splashed or edged in vivid red, the flowers have been solid, semi-starry and are often produced on very small seedlings. I have remade this cross several times using a variety of 'Ellens'. It seems that *D.* Ellen 'Corinna' produces intense colour in its offspring (more then, say *D.* Ellen 'Noelene') but it also passes on very "hippy" looking lateral sepals.

D. Mia Star *(X D.* Miara*)* the variety of colours from whites to yellows, an odd pink, some "clearskins" and many spotted is the most notable feature of this cross. Some better clones are quite good but many have trouble supporting a full raceme of blooms.

D. Allara *(X D.* Hilda Poxon*)* one of my better crosses which has produced mostly whites with red or purple spotting. The clone 'Foz' (Plate 2) is my best and it usually impresses those who see it. A rampant grower and multiple flowerer that could easily be my favourite except that it won't breed! As I flowered only a few from the first cross I have remade it.

D. Tropical Wit *(X D.* Tully*)* — the reason I made this cross was simply to get something out of Col Brandon's magnificent *D.* Tully. I'm glad I did as some really interesting colours have been produced. Two clones stand out (so far), Dennis Wood's 'Freckles' is a ripper (one that got away) and 'Ginger' is pretty nice too. A common weakness in this cross was that some clones failed to open their flowers fully giving them a rectangular appearance.

D. Fleckwitt *(X D. fleckeri* 'Red'*)* I must have kept all the dogs because this cross seems to have impressed others more so than myself. They have mostly carried large numbers of filled-in flowers coloured yellow to orange. All my clones have trouble keeping their lower flowers open long enough to look at their sisters on the top of the raceme.

D. Peach Witt *(X D.* Peachglow 'Brolga'*)* the father here 'Brolga', has been expectedly dominant in the shape department. One clone, *D.* Peach Witt 'No. 1' (Plate 3), in being a clear pale green evidences what can happen when two very dominant (at least for colour) parents seem to cancel each other out. Not a prolific cross and the bulk of them have been in the predictable autumn tones. This cross has two vices, the racemes are a little on the weak side and new growths can be very soft in cool wet weather.

While explaining the 'Graham Hewitt' factor it should be noted that it had probably reached its end in my plans, although I expect there will always be a plant of the "old dog" sitting on the bench just in case. I have remade this hybrid using *D.* Ellen 'Corinna' and *D. speciosum* 'National White'. Some of the better clones so far from this reasonably slow growing (blame 'National White') cross have been the clones 'Beachmere' HCC/AOC/QOS of John Mewburn's, 'Red Lip' and 'Totem Pole' (Plate 5). 'National White' has made sure that there is no problem holding the flowers up. This cross should be remade and would have been, if only I had more space.

SOME OF THE OTHERS

A scan of the hybrid registration book would reveal to anyone that I have registered a considerable number of crosses that have not involved *D.* Graham Hewitt as a parent. There have been at least as many remakes of existing registrations and original crosses that have not warranted being registered. A few notes about some of what I consider my better "other" hybrids follows:–

D. Redback *(D.* Kingrose 'D.B.' X *D. speciosum* var. *speciosum* 'Nerrong'). One of my earlier crosses that consistently produced superior *D. Xdelicatum*-type flowers of very heavy substance. On most clones the insides of the flowers were white with pink tips on the flower segments, the grex name describes the rest of the flower. Our own A.N.O.S. Treasurer, Bob Napier, owns the best *D.* Redback that I know of (another good one that got away!). They can be a little slow to grow and shy flowering, a trait inherited from the *D.* Kingrose.

D. Wykar *(D.* Wyuna X *D.* Karloo*)*. These have been a little slow to grow but several individuals have been worth the wait. Shapely flowers varying from white through to rich yellow have resulted but, on the minus side, they do tend to be a little bunchy.

D. Jeenga (Plate 4), *(D.* Ellen 'Corinna' X *D.* Omega 'Choice Red'*)*. I used a *D.* Omega of Col Brandon's to make this cross. With both parents carrying genes for intense colour it is no surprise that the small number of seedlings resulting from this cross have all been boldly marked. This is one of my most recent registrations and has already been put to stud duties.

D. Brolga 'Roberta' HCC/AOC/NSW (Plate 6). The name Brolga was registered by Wal Upton a year before I flowered my one and only seedling from this cross. Always an orphan — the only protocorm to develop in the flask — I consider it one of the best individuals that I have produced. 'Roberta' is a robust grower and she's very fertile (11 pods in 1993) and so will figure prominently in my hybrids over the next few years. The *D.* Peewee used as the pod parent was a seedling bought from Wal Upton and anyone who knows these *D.* Peewee's will see its influence in 'Roberta'.

D. Red River *(D.* Ellen 'Corinna' X *D.* Tweed 'Z'*)*. Probably my best known hybrid because many combined excellent shape with a variety of colours and because a few more seedlings got spread around. Ken Russell now owns *D.* Tweed 'Z' because it was "too good" for me and because I was "slowly killing it" (mostly the latter!). I have remade this cross using *D.* Ellen 'Noelene' in anticipation of even better shaped offspring (although I expect there will be some sacrifice in the colour department) and a sibling cross using two of the darker clones ('Midnight' (Plate 7) and 'No. 5'). This is one cross that I kept more than a dozen of, although both John Mewburn and Ken Russell were given mother flasks and therefore started out with many more than me.

The first few seedlings to flower from this cross were disappointing, to say the least, pale greenish flowers with muted pink labella and of good to reasonable shape. I would have been happy enough with them if I had not expected so much better. Gradually better ones started to flower, some were red — very dark red — these in particular were of interest to me. Others had a variety of colours varying from golden yellow with a bold red labellum through tones of fawn, bronze, orange and pink. Flower shapes have also been between the extremes of the typical *D. fleckeri*-shape and that of *D.* Ellen. Needless to say *D.* Red River has already been put to work on the production line with seedlings of *D.* Red River 'Midnight' crossed with *D.* Sunglow 'Ira' only a season or two away from flowering and several other crosses to follow.

Hybridists are constantly confronted by questions such as — What cross to make? Which parents are to be used? Which plant should be the pod carrier and which should hand out the cigars? How many seedlings should be kept? What is to become of the rest? Once flowered should it be registered? and What should it be named?

It is hoped that the above provides an insight into how I, a minnow in a large and expanding pool of native *Dendrobium* hybridists, have gone about answering some of these questions. ✻

DENDROBIUM HYBRIDS BY NEVILLE ROPER

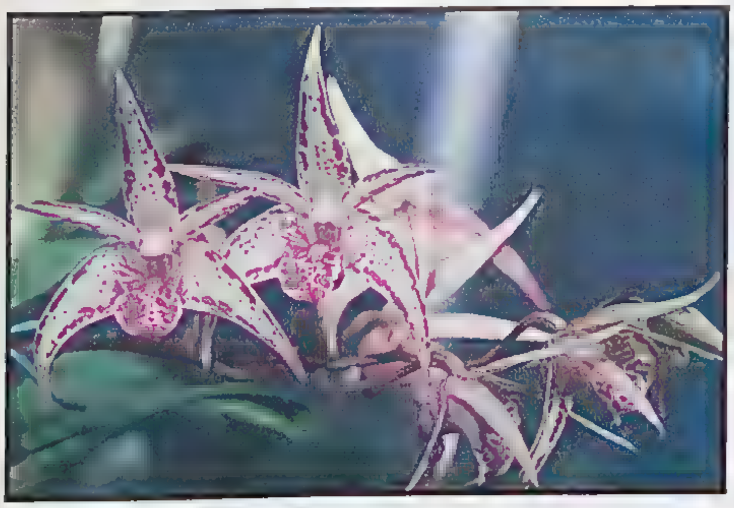
Plate 1: *Dendrobium* Pinterry 'No. 1'.

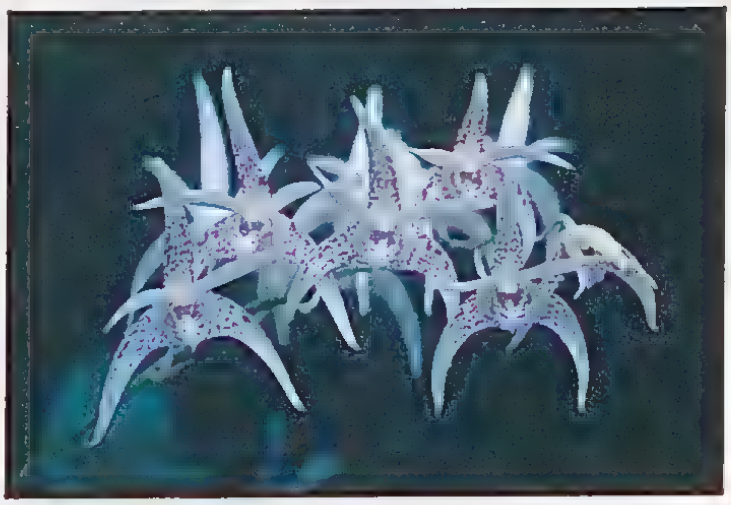
Plate 2: *D.* Allara 'Foz'.

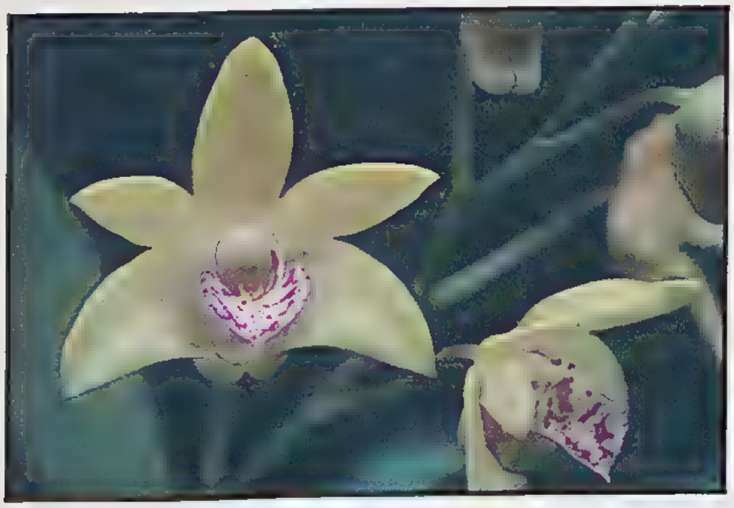
Plate 3: *D.* Peach Witt 'No. 1'.

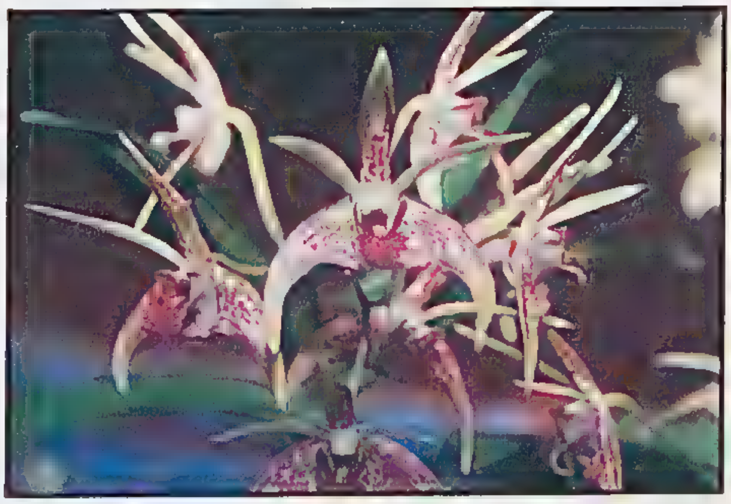
Plate 4: *D.* Jeenga 'Bea'.

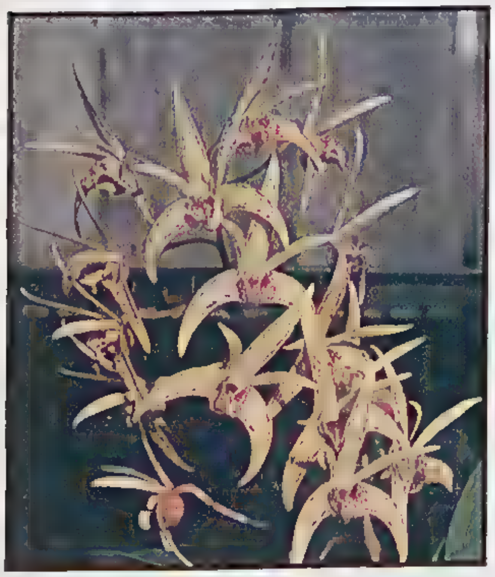
Plate 5: *D.* Graham Hewitt 'Totem Pole'.

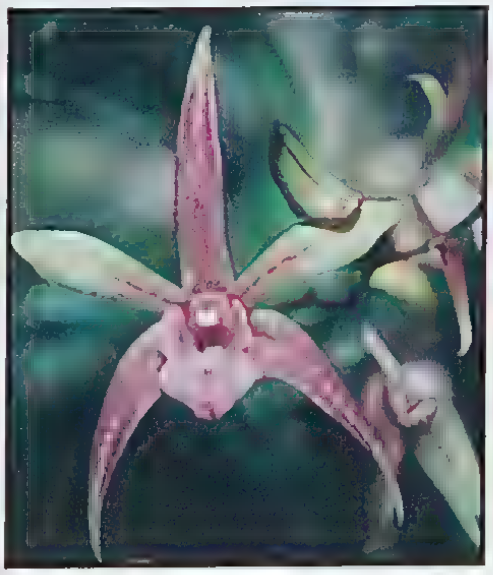
Plate 6: *D.* Brolga 'Roberta' HCC/ AOC/NSW. Photo: D. Wood.

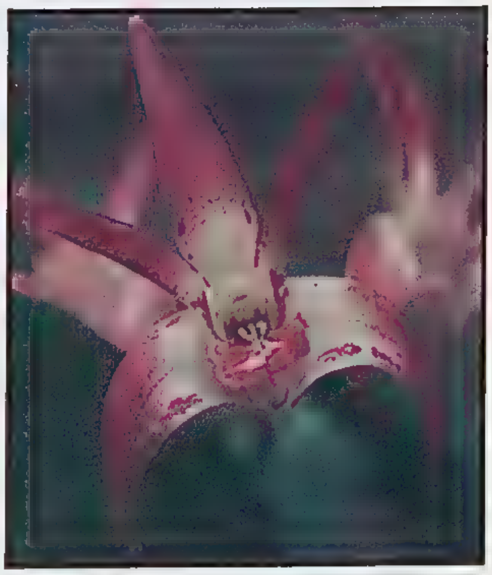
Plate 7: *D.* Red River 'Midnight'.

Photos by N. Roper except Plate 6.

— VALE —
LORRIE FRIAR 1914–1993

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I felt it was a privilege when I was asked to write a tribute to Lorrie Friar whom I have only known in the past 15 years of his life.

In this time he and his wife, Carrie, had a good collection of orchids — mainly natives and softcane Dens. But their favourites were *Sarcochilus* species and hybrids which they grew to perfection in a covered fibreglass house.

Another orchid they grew very well is *Vanda coerulea.* A magnificent plant of this with about eight keikis grew to perfection on a frangipani tree and another on a Macadamia tree.

He was also interested in raising orchids from seed in pots — the symbiotic method. This is an interest he and I shared. Lorrie wrote a number of articles on it and we often talked about it. We showed one another our results.

Lorrie told me that one of the things he liked about orchids was the people he had got to know and become friends with. He liked people. Among his friends were people from all over Australia including such well known personalities as Herb Foot in Western Australia and Jim Rentoul in Victoria. He was saddened over the years with the loss of some of his old friends like Herb and Jim as they crossed the great divide, as Lorrie would say.

He used to go bush in a four wheel drive and showed me and other of his friends a number of orchids he considered special in their natural habitat.

He organised a trip to Casino so Neville Anderson and myself could see *Sarcochilus weinthalii* in its natural habitat with Merv and Alice Bodley.

He took me and other friends at other times to see magnificent clumps of *Dendrobium tetragonum* and *D. teretifolium.*

Lorrie and Carrie visited our home several times each year and after observing that one of my daughters liked the Macadamia nuts he gave us, but had difficulty cracking them, made a special nutcracker for her with his welding equipment. He enjoyed doing things to help other people.

Not only was Lorrie very generous with the time and effort he gave to others, he was also very generous with the plants he gave away. Many people have plants in their collection that Lorrie gave to them.

In the years I knew him, he had difficulty walking through hip and leg problems. He had several operations to help these but unfortunately they did not prove very successful. Even with this difficulty, Lorrie would take people to see orchids in his four wheel drive to places a normal car couldn't go. His main pleasure in this was making people happy. He didn't walk far from the car.

He was a caring conservationist and expressed disagreement with those who collected natives in large numbers or for commercial purposes.

I did not know Lorrie in his earlier life when he was a keen fisherman, a cyclist, a pigeon fancier and bred and showed bantam and game fowls. When he was young he played football and the injuries received playing led to the problems that plagued him late in his life.

During Coffs Harbour's Orchid Festival, Lorrie and Carrie spent two full days manning the door and relieving people at other jobs.

Gradually Lorrie found moving about more and more difficult. On the second last time I saw him, he sat in a chair the whole time I was there and got Carrie to show me the orchids.

The last time I saw him was in June, 1993. It was a pleasant surprise to see him up and about. He walked slowly with the help of sticks to the orchid house. He told me he would not raise any more seedlings and would not go bush any more but he was looking forward to spring and showed me plants he expected would put on a good show. He joked that he did not have time to die, he had too many things to do.

Sadly it was not to be as the end came suddenly and without warning early in August. Lorrie's work continues through Carrie, his wife and daughter, Marion and his grandchildren.

My memories of Lorrie are happy ones of a good friend who went out of his way and often to considerable effort to help others.

He was a life member of A.N.O.S. Ballina Group, the Western Australian Orchid Society and Grafton Orchid Society which were fitting tributes to one who contributed so much goodwill among orchid enthusiasts.

Lorrie's life was an example which anyone would be proud to follow. The lives of the many whom he counted as friends have been enriched by the experience. ✾

NATIVE ORCHIDS AND ME!

Frank Vernon
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My introduction to native orchids occured early in my growing career. My wife, Hanny and I had, in common with so many people, purchased a few cymbidiums from a friend. The intention was to give us a hobby which we could share when eventually I retired. With the cymbidiums came a small plant labelled "*Dendrobium kingianum*". I was told this was a native orchid and put it to one side. For a couple of years nothing much happened — it got watered and fertilised with everything else and grew a bit bigger. Then one day a single raceme developed and three flowers appeared. They were nothing special so far as I was concerned just a pretty pinkish mauve — hardly to be compared with a *Cymbidium!*

The next year, our eldest daughter gave me an "Orchid Tree" for my birthday. This was a piece of branching paperbark with some small plants tied to various branches. There were no labels to tell me what they were. So I hung this in my shadehouse (which was already starting to overflow) and treated it like everything else. Sure enough most of the plants on the "tree" started to regress so I removed the few which looked to be still alive and put them in small pots. One or two I think were cattleyas and they soon succumbed but a couple with very thin canes survived together with one which resembled my *Dendrobium kingianum.*

The plants with very thin canes thrived; the canes grew longer, more appeared and eventually they both flowered. One as a pale yellow and the other a deep gold. Both had reddish spots on the outside of the flowers and the flowers, although quite pretty, did not open very wide and tended to hang their heads. By now I was rather intrigued and decided to find out a bit more about them. Reference to photos in Jim Rentoul's book "Growing Orchids — Book 4" led me to the conclusion that they were both "*D. gracilicaule*". Just after I had given them labels I was told that the name had been changed to "*D. macropus*". Ah well!

The third plant grew well and eventually produced a nice white flower, rather like my *D. kingianum* (which, by the way, was still growing) but larger and with more flowers to the raceme. By this time we had joined the Melville District Orchid Society and I entered this plant at their monthly meeting with the plea for someone to tell me what it was! Someone told me it was *D.* X *delicatum* and this was confirmed by the judges.

So now I had three different sorts of native *Dendrobium* all growing well and flowering each year. Not long after this we attended a workshop held at the South Perth Civic Centre and watched the late Roger Hunt use a tomahawk to divide a large plant which he told us was a *D. speciosum* or King Orchid. I later found that there were several varieties of this orchid and after reference to Rentoul's book, decided it must be variety *hillii.* This was confirmed when it eventually flowered. Guess what! Not long after I read an article in the Australian Orchid Review where a taxonomist decided it should be known as *D. tarberi.* I thought this was a horrible name and decided mine would remain as *D. speciosum* var. *hillii.* So there!

These five plants remained in my collection and grew in odd corners of my shadehouse which by this time had grown a bit bigger. So far as I was concerned they were interesting but could not compare with my beloved cymbidiums. However by now we were visiting various orchid shows and realised there were other genera besides cymbidiums. In one corner of one of the halls there was a section labelled "Australian Native Orchids". Most of these appeared to be grown in rather scruffy pots full of twigs, leaves and other bits and pieces through which appeared a few green shoots and one or two quite pretty but rather fragile looking flowers. However next to them were some plants which looked a bit like mine in their growth habit but with flowers that stopped me in my tracks. These were plants that resembled mine — they grew like mine — but they had flowers so much larger and more colourful.

From then on I was hooked. Wal Upton's book "Dendrobium Orchids of Australia" with its beautiful photographs of both species and hybrids only whetted my appetite. His enthusiasm for this wonderful genus came through so strongly that I was inspired to find out more. Coincidentally both "Australian Orchid Review" and "Orchids Australia" published several articles from people like Phil Spence and Ted Gregory and I started to increase my collection of Australian Native dendrobiums and to discover how to grow them successfully here in Perth. I joined A.N.O.S.(W.A.) when it was first formed and met many more interesting and helpful people.

A highlight for me was to attend the Second A.N.O.S. Conference in Toowoomba and to meet some of my heroes in the flesh. I have learned a lot over the few years I have been growing Australian dendrobiums and discovered I have only scratched the surface.

Incidentally, I still have my original five plants and although not all would win prizes in competition, to me they are very special as they led me to a hobby which I find totally absorbing. ✾

Native Orchid Conference
Call for papers

The first New Zealand Native Orchid Group Conference
will be held with the annual Taupo Orchid Society Field Days
on 2-4 December 1994
to celebrate the official opening of the
Iwitahi Native Orchid Reserve and Heritage Park
by the Hon Simon Upton, Minister for the Environment.
Offers of papers and registration enquiries should be directed to
Trevor Nicholls, 33 Hinekura Ave, TAUPO. Phone: (07) 3784813

AUSTRALIAN ANTELOPE ORCHIDS

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Not so long ago, our botanists determined that the name *Ceratobium* was no longer appropriate and that the name *Spatulata* should be used instead, for that section of the genus *Dendrobium* which contains the so-called antelope orchids. It was a shame that *Ceratobium* had to be suppressed, for the name had been in use for many years and we had become comfortable with it. But in this brave new world of hard-nosed professional taxonomy I guess comfort is no substitute for precision; the rules said *Ceratobium* had to go and we were given *Spatulata* in its place.

Dendrobium Section *Spatulata* consists of approximately 50 species, distributed from northern Australia, through the island chains of the south-western Pacific, across New Guinea and Indonesia and northwards into the Phillipines. Characteristically, the members of this section have twisted floral segments; that is to say that the sepals and lateral petals are, in most species, twisted longitudinally to form spirals, just like the horns of an antelope, hence the common name.

In Australia we have eight section *Spatulata* species. At present none of these are considered endemic, although further investigation may reveal some differences in morphology or interpretation between Australian and non-Australian populations of several species. All of the Australian species occur in the eastern tropics, at low to moderate altitudes, with two species, *Dendrobium canaliculatum* and *D. trilamellatum,* extending to the top end of the Northern Territory.

They are generally not orchids of dense tropical rainforest, but mostly prefer more open habitats, such as paperbark forest, mangrove and palm swamps and open woodlands around the margins of rainforest and on protected hillsides. As such, they are lovers of moderate to strong levels of light and open, breezy situations.

Tropical Australia is largely monsoon affected and except for the wet tropics between Townsville and Cooktown, practically all the rain falls during the wet season, between December and April. Essentially, the antelope orchids have adapted to this seasonal rainfall pattern and their growing habits reflect these conditions. Most vegetative growth is made during the wet months of the year, when temperatures are warm to hot and humidity levels are correspondingly high. Indeed, at least two species, *D. canaliculatum* and *D. trilamellatum,* have become specialised to the extent that they are able to colonise the seasonally arid paperbark forests of Cape York Peninsula, where fire is a regular feature of the dry season environment. They grow rapidly during the wet season and then sit out the dry with no rain whatsoever in most years, until the storms return in November/January. Even those species that inhabit areas where at least some rain falls during the dry season, make most of their growth during the wet and are more or less dormant at other times of the year.

Dendrobium discolor Lindley (Plate 8)

This is the tallest growing member of the group in Australia, the pseudobulbs sometimes attaining well over two metres in height. It grows on rocks and trees, usually in open, brightly lit situations, from sea level to moderate altitudes on the coastal ranges. In the mangrove swamps behind the beaches and along the rivers, it often occurs in abundance and if you can avoid the crocodiles and don't mind knee-deep mud, you can see *D. discolor* in its element.

Large plants often become untidy masses of broken and fallen stems, which produce aerial growths, or keikis, which themselves then grow into adult plants and so on. By this process, *D. discolor* extends itself vegetatively, where conditions are suitable, especially on rocky outcrops along the coast and on many offshore islands, this species forms itself into large thickets.

The flowers on *D. discolor* are carried on long arching inflorescences and are commonly tan to honey-brown in colour, although they range from clear yellow (known as var. *broomfieldii*) through to dark brown, with some forms having rusty red tones. Its main flowering season is spring, but it may flower at any time of the year.

Known as the golden orchid in north Queensland, *D. discolor* is a very common species and is often seen in suburban gardens growing on trees and palms. It performs well in cultivation although its large size may create problems in a small glasshouse.

Dendrobium nindii W. Hill (Plate 11)

Perhaps the most beautiful of our antelope orchids, *D. nindii* is becoming increasingly rare due to over-collecting and habitat destruction. Vegetatively, it resembles *D. discolor,* although it does not grow quite so tall, to about one metre, the stems are usually darker in colour and the leaves are rounder. *D. nindii* is an orchid of the steamy lowland forests and is most often seen close to the coast growing on trees along waterways and around swamps. It prefers situations where it gets good light, often right up in the tree tops in full sun and high humidity. With its large, beautifully veined, lilac/purple labellum, *D. nindii* is much sought after by orchid growers, but it is unfortunately a difficult species to grow in cultivation.

Dendrobioum mirbelianum Gaud. (Plate 12)

This is another uncommon species from the coastal lowlands of north Queensland. It shares the same distribution as *D. nindii* occurring mainly in that narrow corridor of tropical wetlands between the mountains and the sea, from around Innisfail to Cooktown. Like *D. nindii,* it also occurs in New Guinea.

D. mirbelianum grows on trees, usually in mangroves and around coastal swamps and rivers, in situations where bright light and good air movement are available. It generally grows to about 40cm tall and vegetatively may easily be mistaken for a smallish plant of *D. discolor.* The flowers are carried on stiffly erect inflorescences and are light brown in colour. The lip is white with violet veining around the edges.

The flowers on *D. mirbelianum* are not twisted as in most other members of section *Spatualta*. On some forms the flowers are self-pollinating and do not open properly. However, I have seen some plants where the flowers remain fully open and in good condition, even when the capsules are well advanced.

D. mirbelianum is not a difficult orchid to grow in cultivation, although it may be reluctant to flower on occasions.

Dendrobium canaliculatum R.Br. (Plate 9)

If there was a prize for the cutest-looking plant, then *D. canaliculatum* would be a front runner. With its short, rounded pseudobulbs and fleshy, channelled leaves, it really is a most attractive plant. Its relatively small size adds to its charm and an average sized plant would sit neatly on the palm of your hand.

It grows almost exclusively on paperbark trees (*Melaleuca* spp.), especially favouring the broadleafed tea tree, *M. viridiflora* and in many places where conditions are suitable, there are large colonies of many thousands of *Dendrobium canaliculatum* in these paperbark forests.

At least three distinct varieties are recognised, each with its own distribution and preferred habitat and in one form or another, *D. canaliculatum* extends from south of Rockhampton, in central eastern Queensland (on the Tropic of Capricorn), to the top of Cape York Peninsula, across the top end of the Northern Territory and Western Australia and also into New Guinea. In all forms of *D. canaliculatum* there is considerable variation in colour and vegetative habit.

In its best known form, the flowers on *D. canaliculatum* var. *canaliculatum* are white with yellow tips to the segments and the lip is white with strong purple markings. Occasional plants are seen where the yellow colour is replaced by tan or even chocolate brown, making a lovely contrast with the purple labellum. This variety grows in central and northern Queensland, usually on the coastal plain, although in some places it extends to altitudes of up to 500 metres.

On Cape York Peninsula, northwards from about Cooktown, *D. canaliculatum* var. *nigrescens* is the dominant form. It has darker flowers, usually greenish cream to fawn, with coffee coloured tips to the segments. The purple on the labellum is a constant feature.

In the top end of the Northern Territory and Western Australia grows *D. canaliculatum* var. *foelschei.* The flowers on this variety have slender segments, are usually not widely opening and are white with pale yellow, mauve or brown on the tips of the segments.

Near the top of Cape York Peninsula, a colour form of *D. canaliculatum* with almost pure white flowers, with just a hint of yellowish-green on the segmental tips, grows in the scrubs behind the beaches. This may be the variety *pallidum,* a fourth, but poorly understood variety of *D. canaliculatum.*

D. canaliculatum can be successfully grown in cultivation as long as it gets plenty of light and warm, airy conditions. Watering should be considerably restricted during the winter. Slab culture is the usual method and pieces of natural cork, coconut fibre, treefern fibre and hardwood may be used. Pieces of paperbark are also very good, although not from the original host.

Dendrobium carronii Lavarack and Cribb

Known for some years after its discovery in the early 1970's as the "red form" of *D. canaliculatum, D. carronii* can be distinguished by its tall, more or less erect and parallel lateral petals, which are reddish-pink in colour and its bright yellow lip. Vegetatively, it is practically indistinguishable from *D. canaliculatum.*

Although not nearly as abundant and widespread as *D. canaliculatum, D. carronii* occurs in a number of locations on the eastern side of Cape York Peninsula, northwards from the McIlwraith Range.

It tends to grow in areas that are somewhat more moist and which receive some rain during the dry season and in some places it grows alongside the large flowered form of *D. trilamellatum. D. carronii* grows mainly on paperbarks, especially *Melaleuca viridiflora,* but it will also colonise other trees along watercourses and around swampy areas.

It is difficult to grow in cultivation for any length of time, but seems to do best on a slab of natural cork or treefern fibre, or on a length of paperbark. The old addage "hang it high and keep it dry", at least during the cooler months, is probably good advice.

Dendrobium trilamellatum J. J. Smith

A species with a checkered taxonomic history in recent times, *D. trilamellatum* was previously known as *D. semifuscum* and prior to that *D. johannis* var. *semifuscum.* Also known from New Guinea, from whence the current name originated, *D. trilamellatum* occurs in Australia on Cape York Peninsula northwards from around Cooktown and extends to the top end of the Northern Territory.

There appear to be two distinct floral forms of this species, although there are probably intermediates and further field investigation may be required. Where it occurs in the hard, dry paperbark country away from the coast, the flowers are a dull brown or even greyish brown in colour and are only about 30mm tall. The inflorescences are erect and carry eight to 12 flowers. The other form of *D. trilamellatum,* known loosely as "var. *giganteum*", has flowers twice as large in all their parts. They are a rich, lustrous brown in colour and upwards of 20 flowers may be carried on tall arching inflorescences. This larger form occurs further north on Cape York Peninsula, again in paperbark forests, but closer to the coast and in areas that are somewhat damper than the seasonally arid inland forests. This form also grows on mangrove trees along the coastal rivers in some places.

D. trilamellatum grows well in cultivation, as either a pot or slab specimen. It does especially well on a length of paperbark (a fresh piece, not the original host) or on a piece of natural cork. Like all the antelope orchids, it requires strong light at all times and plenty of watering and regular feeding during the growing season. Some plants may grow up to 50cm tall under good conditions. It is a spring flowering species.

Dendrobium johannis H. G. Reichb.
(Plate 10)

This species is closely related to *D. trilamellatum,* which it resembles both florally and vegetatively. There are, however, structural differences in the flowers and *D. johannis* blooms chiefly in the autumn and winter. Also, it is more restricted in distribution, occurring in Australia only in the north-eastern portion of Cape York Peninsula, northwards from the McIlwraith Range.

D. johannis grows in open forest types, in areas where at least some rain falls during the dry season and it is usually encountered around rainforest margins, or on protected hillsides above rainforest gullies. In some locations, the plants seldom get much taller than about 20cm and they tend to grow on the upper branches of host trees and do not develop into large clumps. Then, in other places, they grow mainly on the main trunk of the host, often not more than two or three metres above the ground, where they develop into sizeable clumps with stout stems up to 30cm tall.

The flowers on *D. johannis* are usually quite dark brown, with some forms having lustrous, shiny flowers the colour of dark chocolate. Up to 20 flowers are carried on erect inflorescences and a mature, healthy plant will usually flower prolifically. It is a pleasing species in cultivation and grows well on a slab, but probably better in a pot.

Dendrobium antennatum Lindley

This is a rare species in Australia, known only from the eastern escarpment of the McIlwraith Range in central eastern Cape York Peninsula. It grows on trees along watercourses, especially in more open, rocky situations and around waterfalls, where there is good light and constant air movement.

The pseudobulbs on *D. antennatum* are up to 50cm tall and are swollen in their proximal halves, becoming slender towards the apex. The long-lasting flowers are basically white, with tall, erect, yellowish-green lateral petals and a purple veined lip. Inflorescences arise from the upper third of the stem, often at a fairly acute angle and carry from three to 10 flowers.

D. antennatum does well in cultivation and although it is usually grown in a pot, it will also grow strongly on a slab of natural cork, treefern fibre or hardwood. It will grow into a good sized specimen within a few years and a large plant may be in flower more often than not.

D. antennatum is a little different from the other sect. *Spatulata* species in that it tends to grow continuously, without a definite dry season rest period. Usually by the time a new growth is about three quarters complete, another new growth will be starting and so on.

From the diminutive *D. carronii* to the bamboo-like stands of *D. discolor,* the

Australian antelope orchids are a delightful and distinctive group of species, which are justly popular in cultivation. Whilst each occupies a specific and preferred habitat type in the wild, they form a more or less homogenous group as far as their cultural needs are concerned and most of them respond well to cultivation. Outside the tropics they usually require glasshouse conditions to perform at their best and in southern Australia, artificial heating during the winter is essential. A minimum night-time temperature range of between 12°–15°C is generally considered adequate, although with careful attention to watering, minimums as low as 8°C may be tolerated. A well aerated glasshouse environment is essential to the well-being of these orchids in particular and the use of internal air circulation fans and adequate glasshouse venting is strongly recommended.

Most of the taller growing species are usually cultivated in pots, in a course bark or bark and stone potting mix and the smaller members make fine specimens for slab culture. However, it is up to the grower to experiment with different techniques and no hard and fast rules can be applied in this area. I have seen some marvellous plants of *D. discolor* grown on large slabs of cork and ironbark and although their root systems run rampant and they become very difficult to shift, they nevertheless grow exceedingly well. Likewise, one of the best plants of *D. canaliculatum* I ever grew was in a pot, so the point to be made is that there are always exceptions to the rule.

Like nearly all orchids, these tropical dendrobiums like to be repotted on a regular basis. But what they don't like is to be disturbed during the cooler months, when they are resting or growing slowly. The trick is to repot only during the warmest time of the year, when they are growing strongly and the disturbance of the repotting process will be quickly overcome.

By the time Christmas is upon us, days are usually warm to hot and temperatures at night seldom drop below 20°C. also, rainfall increases during December and January and humidity levels are generally higher. The other factor that stimulates increased growth rates at this time of the year is longer day length, associated with greater light intensity. These orchids are lovers of bright light and they will not perform properly in less than adequate levels. Combine the above factors with plenty of water, feed and fresh air and you get just the conditions they need to grow and grow quickly.

Repotting should be done as the new roots begin to emerge from the bases of the newly developing growths. You will also notice at this time that the existing roots will have recommenced growth by extending their green root tips and by sending out fresh, laterally branching roots.

Usually by the time the new growths are 5–10cm tall, the new roots will begin to develop. The roots initially appear as indistinct bumps on the bases of the new growths, but within a couple of days they develop into normal orchid root tips as they lengthen. If they are allowed to get too long before repotting is done, then the grower risks damaging the soft new roots during the process. This is not necessarily a disaster, as the orchid will be quite capable of producing more new roots if required, but it is best avoided.

There is just something about the way new roots take to fresh potting mix that leaves no room for doubt about the benefits of repotting. It is always very satisfying to see a new crop of roots finding their way across and into the potting medium and it's as if the presence of fresh mix actually stimulates stronger and better root production. Certainly, the fact that the plant has been disturbed creates an impetus for regenerative root growth, to replace damaged and severed sections, but the fact that the old potting mix has been removed from around the base and roots of the plant and a new pot with fresh potting mix has been provided, creates an extra stimulus.

The word "sweet" is often used to describe the state of fresh potting mix, as opposed to the "sour" nature of old or aged mix. It is difficult to precisely analyse these terms in relation to the condition of orchid potting media, apart from saying that as the mix ages, it slowly breaks down, or composts if you like and in the process loses its structural integrity. The effects of these changes are that the medium tends to pack down, it becomes more moisture retentive and less open to free air movement and it decreases in pH (i.e., becomes more acid). It should be noted that these changes are a normal response of organic potting mix components to being enclosed in a pot and regularly watered and drenched with nutrient solutions. In the short to medium term they are beneficial to the orchid's well-being, but the more advanced these changes become, the more the mix loses its ability to sustain good root health. In short, the potting medium slowly becomes toxic and an orchid left too long in such conditions will lose its roots. Of course, a lot depends on the watering and feeding habits of the grower and those who water and feed heavily will need to repot more frequently. Also, the smaller the grade of the potting mix, the quicker it will break down because it will retain more moisture.

Growers will have noticed how these orchids often grow better when they reach the edge of the pot, with their roots growing down the outside of the container and into mid-air. Plants grown on slabs also demonstrate this lesson well. This is because these roots are not restricted to the confines of the pot and the questionable condition of the potting medium. They are free and completely exposed to the open air where they cannot become waterlogged by a poorly aerated, soggy mix. They get wet during watering but dry out again quickly, just as they are adapted to do. Such open, airy conditions are those which the grower should aim to create on the inside of the pot as well, so that the orchid's root system will be equally as happy on the inside as it would be on the outside. Regular repotting is the secret to achieving this aim, choosing a type and grade of potting mix to suit your conditions and watering habits is an important consideration.

Orchid growers are stubborn creatures and they usually find it difficult to genuinely amend their cultural methods. It is easier to persuade a grower to try a courser grade of mix, in order to accommodate a heavy-handed watering regimen, than it is to convince him to water less frequently. So, you take the line of least resistance and change to a larger grade but leave watering practices unamended.

That's what I decided to do a couple of seasons back. I found a lot of my antelope orchids were not growing as well as they should, so I looked at the problem carefully and came to a few conclusions. The first thing I decided was to increase the grade of pine bark I was using in my mix for these orchids. I had been using a medium grade of 10–15mm size, but I upgraded to 20–25mm, in order to allow more fresh air to circulate through the mix and reach the roots. I also cut down on the percentage of stone in the potting medium, from approximately 40% to 25%. For many years now I have been using quartz pebbles as a component in my orchid mixes. I have also experimented with blue metal, washed river gravel and scoria, but quartz seems to me to be best. Besides, I like the look of the white quartz against the dark pine bark. However, I decided to cut back on the amount of quartz in the mix to reduce its waterholding capacity. Although I cannot explain exactly why, the more stone there is in a mix, the more moisture it seems to hold. You would think that the opposite would be true because of the non-porous nature of quartz stones, but the more you increase the percentage of stone, the more the mix will retain water. This is not normally a problem during the warm growing months, but during the cooler months, when these plants are in resting or slow growth mode, they resent wet feet and need to dry out considerably and a damp, cold potting mix is not to their liking.

The other thing I did was to standardise pot types and sizes. For large plants in 200mm pots or larger I use terracotta pots and for

80–150mm I use plastic net pots. Generally speaking, the only things that need the large terracotta pots are large plants of *D. discolor, D. Xsuperbiens (D. discolor X D. bigibbum)* and the like. These are kept on a separate bench so they can be given different treatment. I also try to keep pot sizes together in groups to more accurately control watering.

So, to summarise, the potting medium I use for my antelope orchids is:–

80% coarse grade bark (20–25mm diameter)
20% quartz pebbles (10–20mm diameter)
Repotting is done about every three years, during the Christmas/New Year period.

The importance of adequate feeding and watering, in conjunction with the provision of good light and plenty of fresh air, cannot be overstated with regard to antelope orchids. These are plants with a definite growing season, the warmer, wetter period of the year, from November-April and when they are in active growth, they grow rapidly. More so than any other type of native orchid, they require good nutrition during their growing season in order to produce strong, thick pseudobulbs which will harden and mature during autumn. If feeding is withheld or inadequate, the new growths will not develop quickly or strongly enough and they will be susceptible to fungus attack, especially as the weather begins to cool during April and May.

There are so many different types of fertilisers available, from expensive inorganic precision formulations down to good old blood and bone or chook exhaust, that the choice can be a bit bewildering. I have come to believe that it probably doesn't matter too much what type of feeding programme you are using, as long as you are feeding with something and you are doing it regularly. Over the past couple of years I have been using chemical (inorganic) fertilisers and I have been applying them at the full recommended strength on my antelopes and other tropical hardcane types. This past growing season I have used an orchid feed called HSO 22, with an N.P.K. ratio of 22.8.12 approximately. It has more calcium than most other formulations, which adds to general plant health, as well as other trace elements. To date, I have been very pleased with the results.

From the end of October until late March, I like to feed these orchids twice a week, if and when possible and as long as the weather is warm and night-time minimum temperatures are not falling below 20°C, I generally feed in the evening. As with watering, it is beneficial for the plants to remain damp overnight, so that they have the opportunity to absorb as much water and nutrients as possible. However, growers should be aware of the dangers of watering and/or feeding in the late afternoon or evening, if temperatures are likely to drop much below 20°C during the night. I only water and feed in the evening as long as I feel confident that I will be able to leave my glasshouse fully open all night long, without the heaters switching on. The last thing I want is for my plants to be wet overnight, when it becomes cool enough for artificial heating to be required. Such conditions are an invitation to fungus problems and if I am in any doubt, I leave watering until the following morning.

It is important for these orchids to have completed and hardened their growths by about the end of April or early May. This usually is not a problem for most species, but for some of the taller-growing types, which as mature plants may have pseudobulbs well over a metre tall, this may be difficult. *D. discolor* and *D. nindii* simply often cannot grow a full sized pseudobulb from beginning to end in a single growing season, at least not in temperate climates and the grower may have to contend with nursing along a half or three-quarter completed growth from the end of one growing season until the beginning of the next. To be successful in this, the grower must ensure the plant continues to grow, however slowly, by keeping up an adequate supply of water and feed and by providing continued good light and warm conditions.

Most of the Australian antelope orchids like to have a rest period during the cooler winter months. As long as they have completed and matured their new growths, then watering can be cut back and feeding restricted. The newly completed pseudobulbs should be stout and hard by the end of autumn and all the grower needs to do is provide enough water over winter and until flowering, to keep them plump and stop them from shrivelling. During the winter months I would not water these plants more often than once every 7–14 days, depending on the weather. At this time of the year, the plants will be putting their energies toward flower production, not vegetative growth. The inflorescences begin to develop once the pseudobulbs have matured fully and they can be seen initially as small bumps right at the apex of the new bulb. They develop over a period of months, slowly but surely extending upwards, with the flower buds gradually forming and increasing in size. Overwatering at this time will cause leaf drop or fungus attack and it may also stimulate the plant into initiating a new growth at the wrong time of the year.

During winter, provide plenty of bright light by reducing the amount of shading or screening on the glasshouse roof. Continue to keep the glasshouse environment well ventilated. A heavy, humid glasshouse atmosphere should be avoided and it is very important to water only in the morning, not during the afternoon or evening. Watering in the morning will allow the plants to dry out during the day, so they will not be wet overnight. Also, try to keep water off the leaves and developing flower buds as best you can.

Most of the antelope orchids are grown in pots, for ease of handling, but the smaller species, especially *D. canaliculatum* and *D. carronii,* perform best on slabs. *D. canaliculatum* can be cultivated quite successfully in a pot, but slab culture seems to suit it better. Pieces of natural cork and lengths of paperbark are commonly used and I also like coconut husk. *D. carronii* I have never tried in a pot; I have had some pleasing results with this species tied to small slabs of treefern fibre and pieces of coconut husk. Even so, it is still a touchy proposition in cultivation and apparently healthy plants, with strong, fat pseudobulbs, will often simply collapse and the bulbs shrivel up. The grower then has to start again and slowly rebuild the health of the plant, as over the ensuing two or three seasons the pseudobulbs again build up to full size. It can be a frustrating business, but when a plant flowers, all is forgiven.

Both *D. trilamellatum* and *D. johannis* can also be grown quite well on slabs, but my preference is for pot culture for these two. *D. johannis* in particular appreciates the extra moisture when grown in a pot and over the past year or two I have moved several plants from slabs back into pots and they have been the better for it. *D. antennatum* I grow both on slabs and in pots and I cannot decide which is better. The slab cultured specimens are on good sized pieces of treefern fibre and my best plant is well established on a chunk of soft treefern (*Dicksonia antarctica*), with an ant plant (*Myrmecodia* sp.) included for good measure. *D. antennatum* seems to like to get its roots deep into the treefern fibre, again, I expect, looking for that extra moisture.

Several of the *Dendrobium* sect. *Spatulata* species have restricted distributions within Australia and are now uncommon in this country. Even some of the more common species have been severely reduced in certain areas. Orchid collectors must bear some responsibility, but habitat destruction has been the main cause. Unfortunately, this process continues, although probably not to the extent it has in previous years. Apart from *D. nindii* and *D. mirbelianum,* I have flasked and grown from seed all of the Australian antelope orchids. They are usually not too difficult, although *D. canaliculatum* and *D. carronii* can be a problem. The trick with seedlings is to keep them growing; keep them warm and do not let them dry out. In the long run, it will be these seed raised plants that will be used to perpetuate the species in cultivation. Each generation of nursery plants becomes easier to grow, because raising them from seed and growing them to maturity is a form of selection; you are selecting those individuals that will grow and flower in cultivation. ✤

Plate 8: *Dendrobium discolor* 'Salak Brunette'.
Photo: D. Titmuss.

Plate 9: *D. canaliculatum.* Photo: D. Titmuss.

Plate 10: *D. johannis.*
Photo: D. Titmuss.

Plate 11: *D. nindii.*
Photo: W. T. Upton.

Plate 12: *D. mirbelianum.*
Photo: D. Titmuss.

Plate 13: *Cadetia collinsii.* Photo: D. Titmuss.

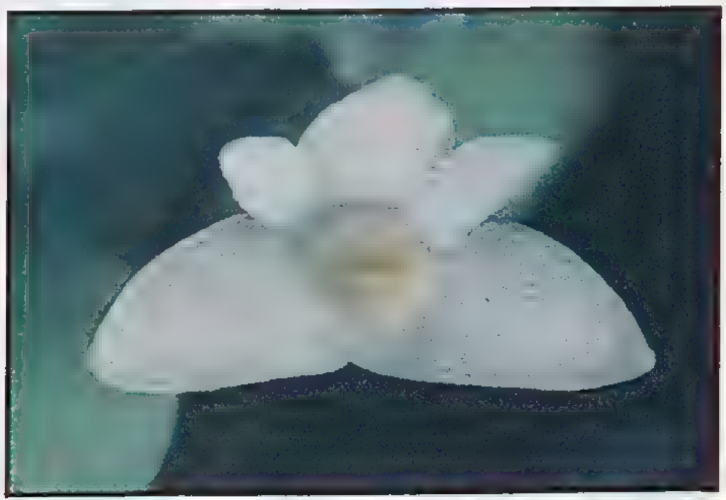


Plate 14: *C. wariana.* Photo: D. Titmuss.

TROPICAL TERRESTRIAL ORCHIDS OF WESTERN AUSTRALIA

Kingsley Dixon
Kings Park and Botanic Garden
West Perth, W.A. 6005

Only in the past 15 years have the terrestrial orchids of the tropical north of Western Australia become more fully understood and appreciated. Previously the inaccessibility and trying climate during the orchid growing season made botanical exploration and trips by amateur groups very difficult.

The majority of the terrestrial orchids found so far are restricted to the moister western areas of the northern Kimberley. This region is notorious for its inaccessibility and vulnerability to heavy rainfall which can reduce the scant road system to an impassable quagmire for months on end. The region is also known for its vast distances between settlements and remote stations. Field work in the past has therefore often been limited to the dry season or restricted to sites adjacent to wet season accessible areas. It is no wonder then that the orchids of the region which flower in the early to mid wet season are so under collected with most distribution information based on scant knowledge often of opportunistic collections.

Recent sponsorship though has enabled the first large scale wet season inventories to be taken for the orchids of the Kimberley region. Argyle Diamond Mines, Wesfarmers, B.H.P., E. G. Green and Sons and Bow River Diamonds have contributed to a project to research the distribution and occurrence of orchids in the Kimberley region and to develop a full set of definitive paintings of these orchids. The noted botanical artist Patricia Dundas has worked on obtaining sponsorship for the Orchids of the Kimberley Project and in production of the paintings. Staff of Kings Park and Botanic Garden have been involved in arranging logistics for the trips and obtaining botanical details.

The Orchids of the Kimberley Project has now been underway for 18 months and has been successful in extending the distribution range for most of the terrestrial species. A number of previously thought rare orchids are now found in new and less vulnerable locations, e.g., beard orchids (*Calochilus holtzei* (Plate 23) and *C. caeruleus* (Plate 25)) are now found in good numbers over a 300km range where previously they were restricted to small areas of the Mitchell Plateau. Locating orchids in these new locations has helped in developing a better understanding of the habitat preferences for these species which will ultimately help further search efforts.

An exciting outcome of the study is that much of the moister west Kimberley is actually good orchid country and that it is all a matter of searching out the right location at the right time. The large area of possible orchid habitat involved (about one quarter the size of Victoria) makes a trip in the wet to search out orchids an expensive and time consuming task. The intrepid and supportive station people of the Kimberley have been one of the most important ingredients for making a success of the Orchids of the Kimberley Project. The invaluable assistance and fantastic hospitality of Robin and Butch Maher of Theda Station (Plate 16), Debbie and Chris Holt of King Edward River Station, the Barrett family of Beverly Springs Station has made this project all the more pleasurable and successful. Their combined efforts during and searching for orchids between trips has helped enormously in developing a more comprehensive understanding of the biology of Kimberley orchids. Kimberley orchids flower in the summer (wet season) which is also a time of high temperatures matched by equally debilitating humidity with a generous helping of sandflies and march flies. All this discomfort seems insignificant with the discovery of new orchid locations and the comradeship of evenings back at the homestead!

THE WEST KIMBERLEY REGION

The vegetation of the region is similar to that of parts of the arid tropics of Queensland and the Northern Territory. There are no unique orchid species in the Kimberley and most are found across the north of Australia and extend into northern N.S.W. However the orchids of the region are the only locations in the state for all of the tropical species. For southern enthusiasts, Kimberley orchids provide a welcome orchid highlight during the long summer dormancy of southern terrestrials.

In recent evolutionary times, the flora of the Kimberley region was most likely wet tropical but as climatic conditions have become drier these once widespread tropical forest species have in many instances retreated to refugial areas — river and stream valleys and the monsoon rainforests patches. These monsoon rainforests or vine thickets contain many tree species but have a sparse and species poor understorey.

Twelve species of orchid are recorded in tropical Western Australia. *Dendrobium affine* and *Cymbidium canaliculatum* are the two epiphytic species. One epiphyte, the native cymbidium, *C. canaliculatum,* is usually found growing in tree hollows throughout the Kimberley region. The green and maroon flowers are scented and produced in pendulous spikes. The sponsored research has located the apple green and white form (Plate 19) of the orchid which was previously unknown for W.A.

KIMBERLEY *HABENARIAS*

Habenaria is a large genus of terrestrial, tropical and temperate species found in many parts of the world.

The genus is the most common of the terrestrial orchids in the Kimberley and often grow in extensive colonies in low lying or seepage areas.

Habenaria triplonema (Plate 24)

A widespread but uncommon species to 30cm tall. The erect, stout scape produces between 10–20 flowers, each bloom remaining open for 10–14 days.

The species grows in basaltic, loamy or lateritic soils which are free draining. The species is most often found in eucalypt woodland and savanna though occasional specimens may be found growing in rock ledges and crevices along streams.

Habenaria ochroleuca (Plate 27)

Each spike produces 10–20, small, 10mm wide white flowers with the lateral sepals spreading, upturned with the labellum very deeply divided into two, equal, sickle-shaped lobes.

Common and widespread on the Mitchell Plateau and locally abundant from the Carson to the Drysdale Rivers. Flowering from January to March. Plants favour well drained gravelly-loam to loam soils.

Habenaria sp. nov. (Plate 28)

This undescribed species which is also known from the Darwin area. The plant is 15–20cm tall with 2–3 olive green basal leaves up to 5cm long. Scape has 15–30 white flowers, with the labellum divided into three, 5–8mm long lobes.

Plant favours loamy soils in moist or seepage areas with the scape produced amongst and above the low grassy vegetation from December to February.

Originally only known from Mitchell Plateau this species is now the most widespread *Habenaria* and occurs from Beverly Springs Station to the Carson River.

Didymoplexis pallens (Plate 29)

A genus of 10 species found in South-East Asia, India and Oceania.

Only *D. pallens* is recorded for Australia and occurs from northern Queensland to Darwin. The demure, leafless habit of the plant and small, insignificant flowers accounts for the infrequent records for this orchid.

The first Western Australian record of this species was in February, 1986 (not November and December as recorded for other Australian collections) from the Mitchell Plateau and consisted of a single specimen with a scape and a number of buds and one open flower. The

ORCHIDS OF THE KIMBERLEY

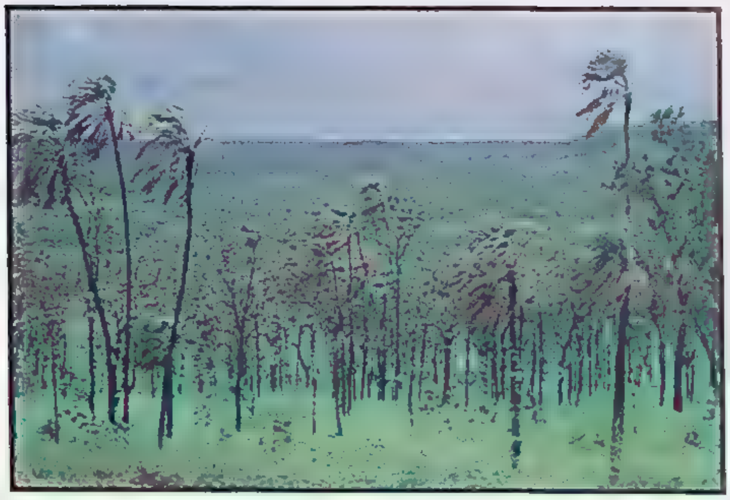


Plate 15: Palm woodland vegetation on the Mitchell Plateau. Home to a number of *Habenaria* and others.

Plate 16: The Maher family from Theda Station and *Dipodium stenochilum.*

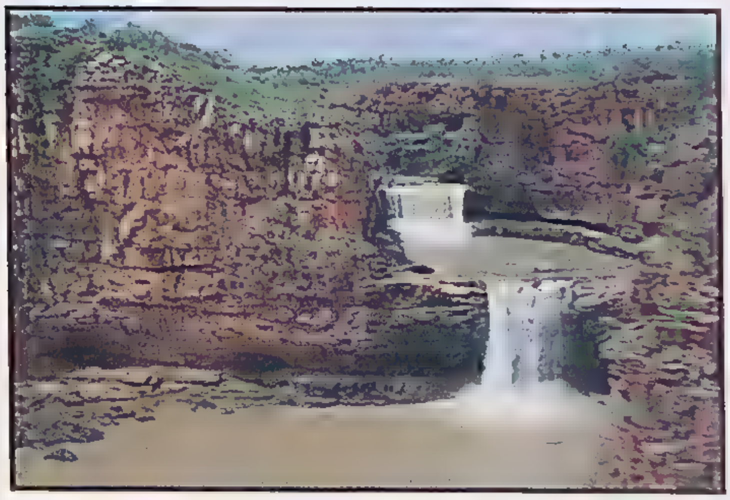


Plate 17: Orchid searching supplemented by outstanding scenery Mitchell River Falls.

Plate 18: Bringing home the orchids. Samples being swum across a river east of Derby.

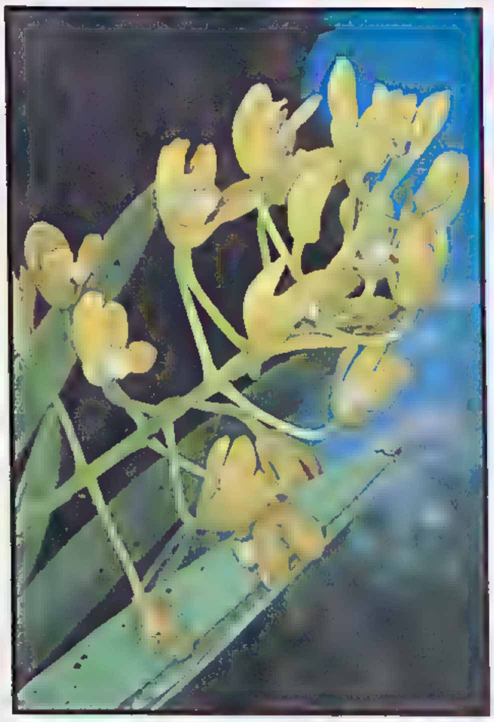


Plate 19: Apple green form of *Cymbidium canaliculatum.*

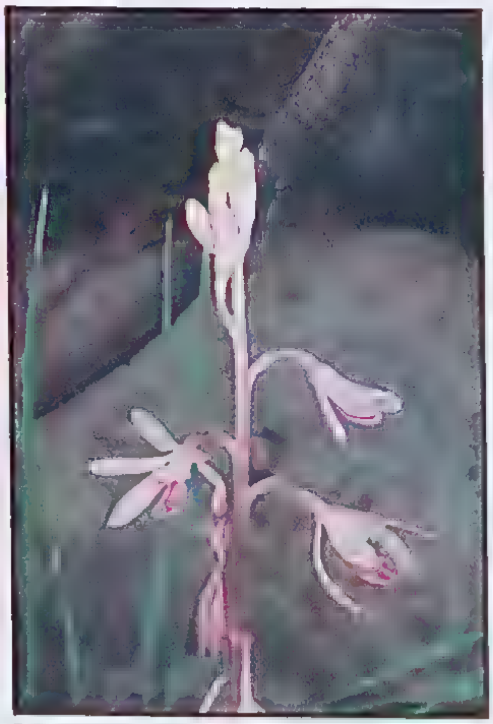


Plate 20: Undescribed *Dipodium* sp. from sandstone country, west Kimberley.

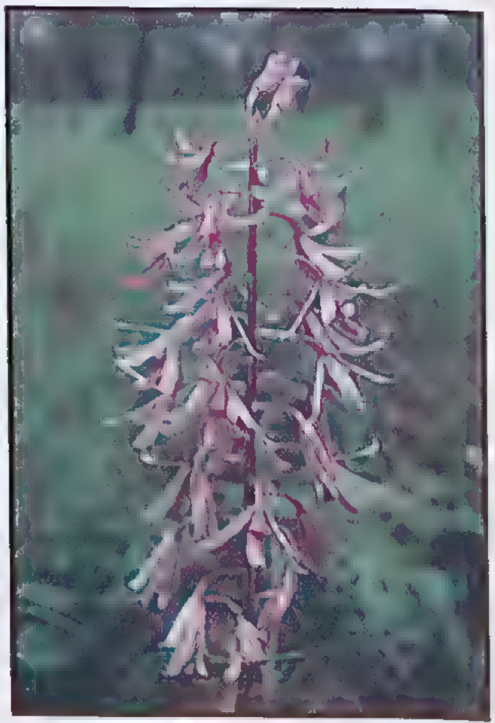


Plate 21: *Dipodium stenochilum* from grassland savanna.

Photos by Kingsley Dixon

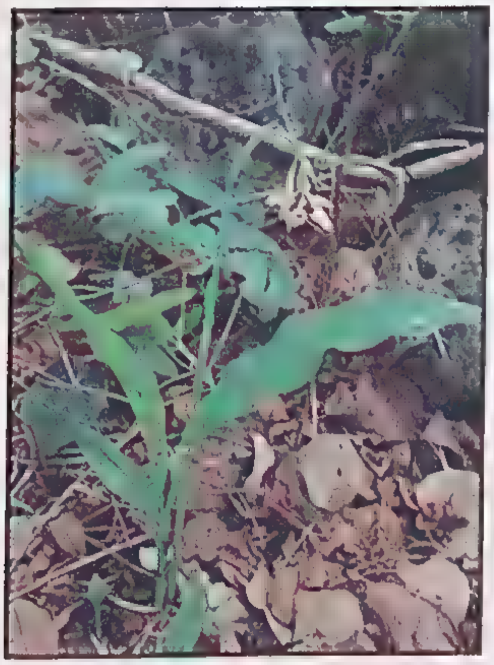


Plate 22: *Geodorum neocaledonicum* in rainforest.

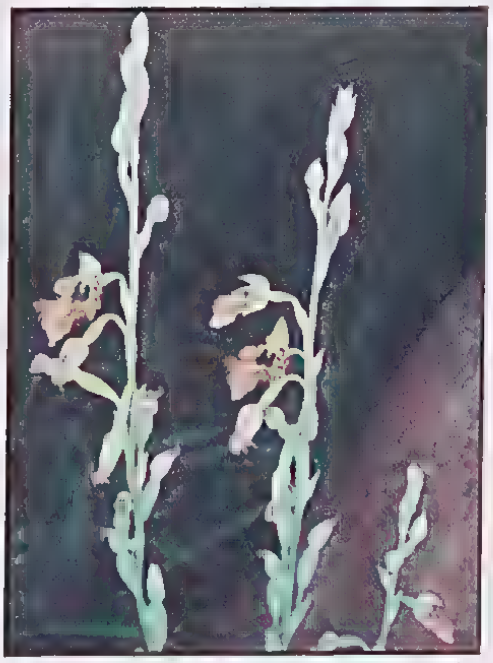


Plate 23: *Calochilus holtzei* often in clumps at base of eucalypts.

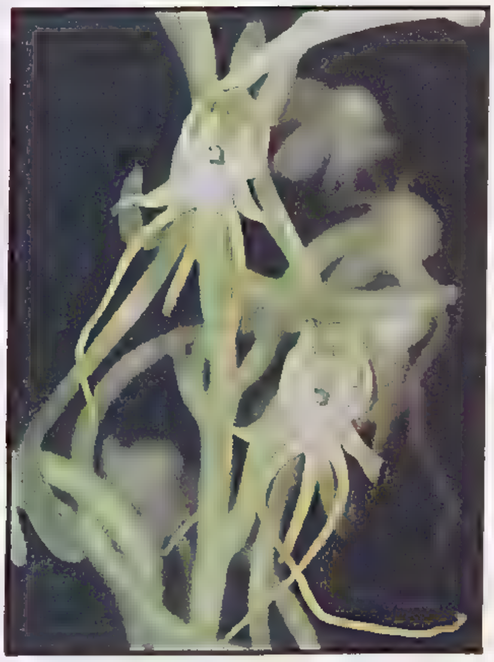


Plate 24: *Habenaria triplonema.*

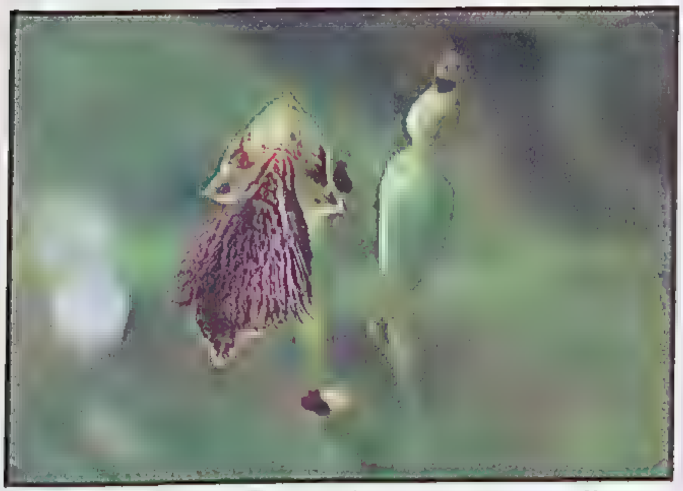


Plate 25: *Calochilus caeruleus* from seasonally wet areas.

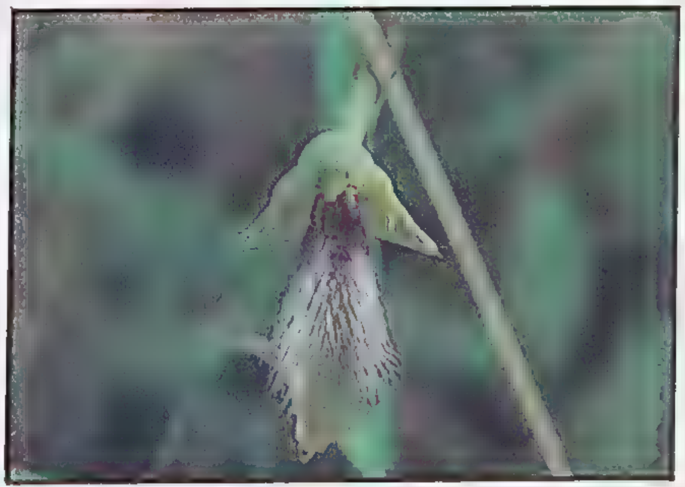


Plate 26: Rare "grey beard" form of *Calochilus caeruleus* known from only one site.

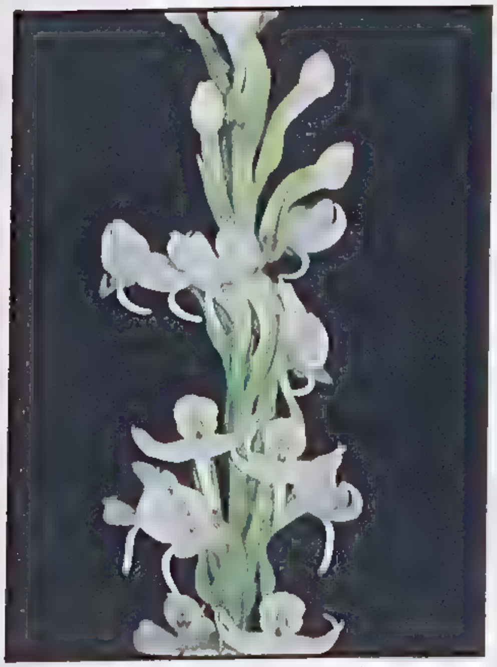


Plate 27: *Habenaria ochroleuca.*

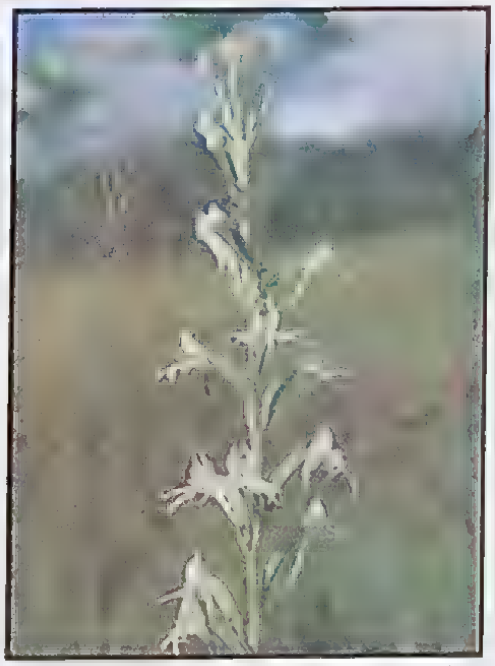


Plate 28: New *Habenaria* sp. also from Darwin region.

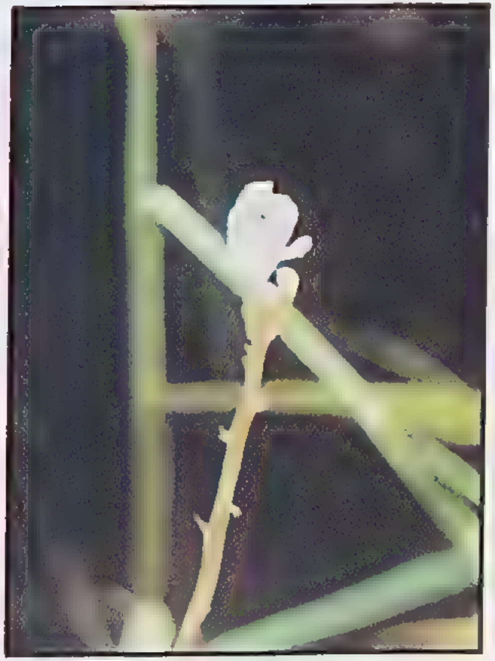


Plate 29: *Didymoplexis pallens* rarest orchid of the Kimberley.

Photos by Kingsley Dixon

plant was growing in a tussock of cane grass (*Sorghum* species) on loamy soils adjacent to a watercourse.

Plant *Grastrodia*-like, underground tuber swollen at regular intervals. Tuberous segments 10–18mm long, 5–7mm wide, ovoid, pointed and brown with scattered scale leaves and occasional lateral branching. Tuberous segments connected by a 5–15mm long and thin stem segment. The flower scape is 8cm long, with small white flowers produced in succession along the stem.

Nervilia holochila

Only recorded once in flower but widespread in the Kimberley region forming extensive colonies of leaves. The leaves are solitary and pleated, 5cm wide and 10cm long on a erect, 2–3cm long stalk. Daughter plants can be produced on the ends of 5–10cm long underground rhizomes.

Grows in loamy, stony soil in savanna grassland or in thick leaf litter in monsoonal vine thickets.

Dipodium stenochilum (Plate 21)

A leafless, saprophyte which produces an erect, 50cm tall scape of up to 25 flowers, each pale pink peppered with dark pink spots. Sepals 1.5–2cm long slightly longer than petals; labellum pink with a prominent white, hairy patch near the apex.

This attractive plant favours deep red loams in eucalypt savanna often growing along disturbed road margins and flowers from December to February.

Geodorum neocaledonicum (Plate 22)

A genus of 10 species found throughout South-East Asia and New Guinea. *G. neocaledonicum* is widespread in northern Australia but in Western Australia is restricted to moist forests and humus rich sites in river gullies and gorges.

This is one of the only herbaceous terrestrial orchids in W.A. which produces persistent pseudobulbs. The flowering scape is produced from December to January (February) at the same time as the new shoot and arises from the axil of a lower leaf. Flowers 10–20, pale pink to white, compressed tubular, 1.5–1.8cm long.

Eulophia bicallosa

A large genus of South-East Asian and African tropical terrestrials. Four species occur in Australia with only one found in Western Australia.

A widespread but uncommon species flowering just prior to the onset of rains in October to November. Flowers pale to ivory on a 60cm tall scape, with 40cm long leaves produced after flowering.

KIMBERLEY BEARD ORCHIDS

Calochilus caeruleus (Plate 25)

The smaller and more inconspicuous of the 2 beard orchids found in the Kimberleys with overall height not exceeding 20cm. The 15–20cm high scapes carry 2–5 red-brown and green flowers which last for up to 3 days. A pale green form with a “grey beard” (Plate 26) is recorded from one site near the Carson River.

This is a widespread but rare species from loamy sands to black loams which are seasonally damp to wet. Plants occur singly or in clusters and flower from January to March. A difficult species to locate because of the small stature of the plant and dark colouration of the flowers.

Calochilus holtzei (Plate 23)

Stout species to 100cm high. The single leaf is fleshy and distinctively keeled becoming almost 3 winged in section. Scape 5–30 flowered. Flowers green-yellow with red markings with a large and distinctive labellum.

Widespread and locally common on rocky, lateritic soil to gravelly loams to loamy soils often at the base of eucalypts from east of Derby to Mitchell Plateau and east to the Carson River. Flowers December to February.

CONCLUSION

The orchids of the Kimberleys are an interesting and diverse group of plants which have demonstrated that the region is a rich resource of orchid species. Most of the stations in the west Kimberley provide excellent accommodation and fly-in stays during the wet and orchid enthusiasts should contact the station owners directly for details. ✾

AUSTRALASIAN ORCHIDS ILLUSTRATED

No. 13: *Phaius pictus* T. Hunt

Common Name:	No common name
Subfamily:	Epidendroideae
Tribe:	Epidendreae
Subtribe:	Bletiinae
Genus:	*Phaius* Lour.

Distribution: *Phaius* is a genus of about 50 species, extending from India, through southern China, South-East Asia and New Guinea to Australia where four species occur, three of which are endemic. *Phaius pictus* is endemic to south-eastern Cape York Peninsular where it grows on the floor of the rainforests from sea level to the mountain ranges.

Notes: Most species of *Phaius* are bulky, evergreen, terrestrial plants with fleshy, angular pseudobulbs formed into clumps. *Phaius pictus* is exceptional in that its stems are elongated, rather thin and erect to 60cm high, bearing three to five large apical leaves and two well developed sheathing bracts. Leaves are large (70cm x 10cm), thin-textured, pleated and dark green in colour. The inflorescence arises from the sheathing bracts at the base of the stem, are up to 90cm tall and bear four to 20 large flowers (about 5cm across) that are brick red with yellow stripes on the inside and yellow on the outside. The flowering time is from April to June. *P. pictus* prefers warm to hot, humid environments, often growing in moist areas of local seepage or close to streams on the forest floor in low light.

Pollination: There is no recorded pollinator of this species.

Conservation Status: This plant has a very limited distribution and exploitation of its habitat has depleted the number of wild plants.

Culture: *Phaius pictus* is a shade-loving plant that requires warm, humid, but airy, conditions. A potting mix of well drained, humus-rich soil is satisfactory. Low light is adequate. Copious water during the growing season with regular watering for the remainder of the year is ideal. Regular feeding with weak liquid fertilisers is beneficial during the summer growing season.

Illustration: The painting illustrates a mature plant of *Phaius pictus* as seen in its natural habitat.

Description: By Noel Grundon, Toowoomba, Queensland.

Painting: By Mair Swann, Atherton, Queensland.

Line Drawing: By Walter T. Upton, West Gosford, New South Wales.

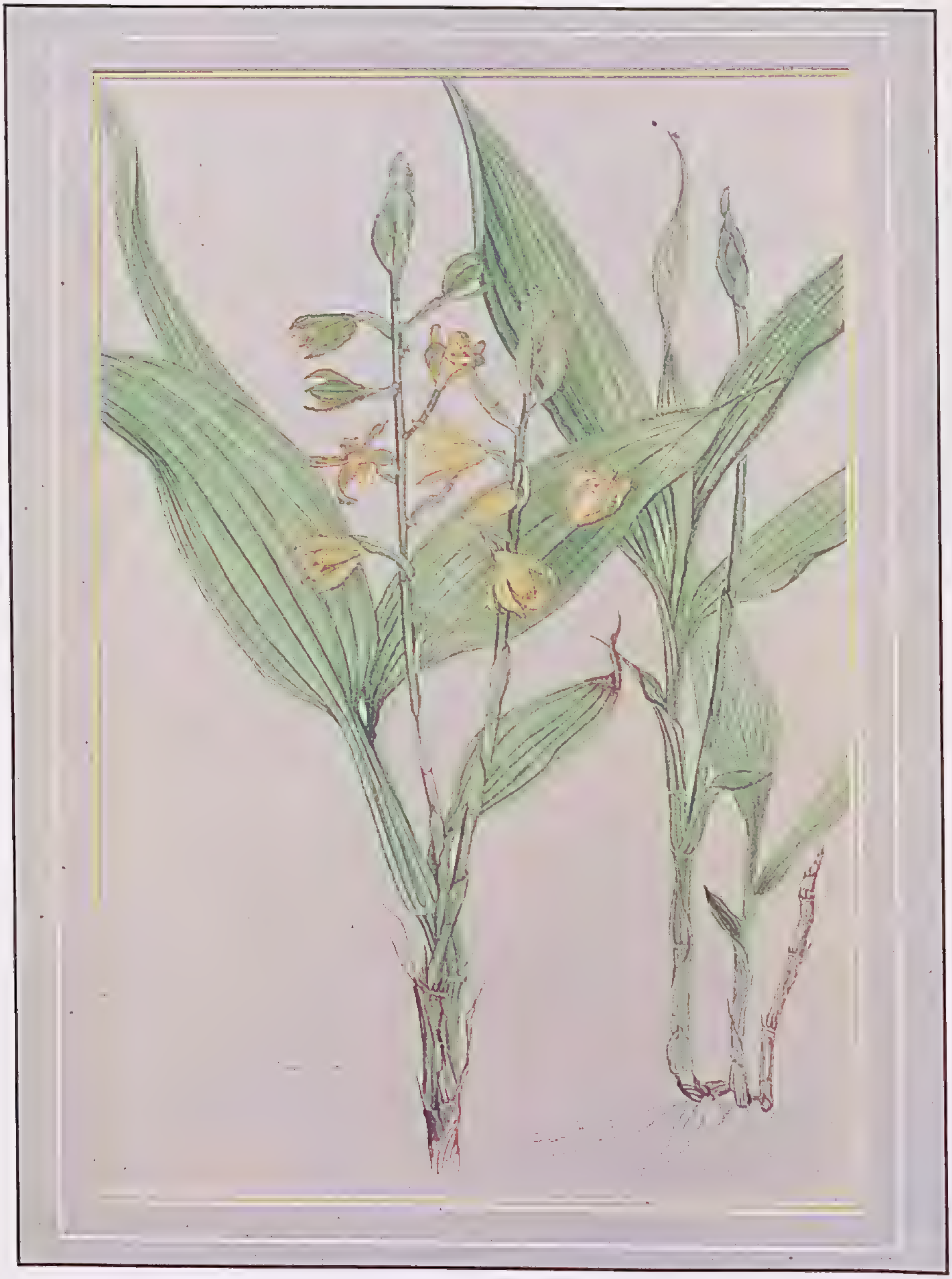
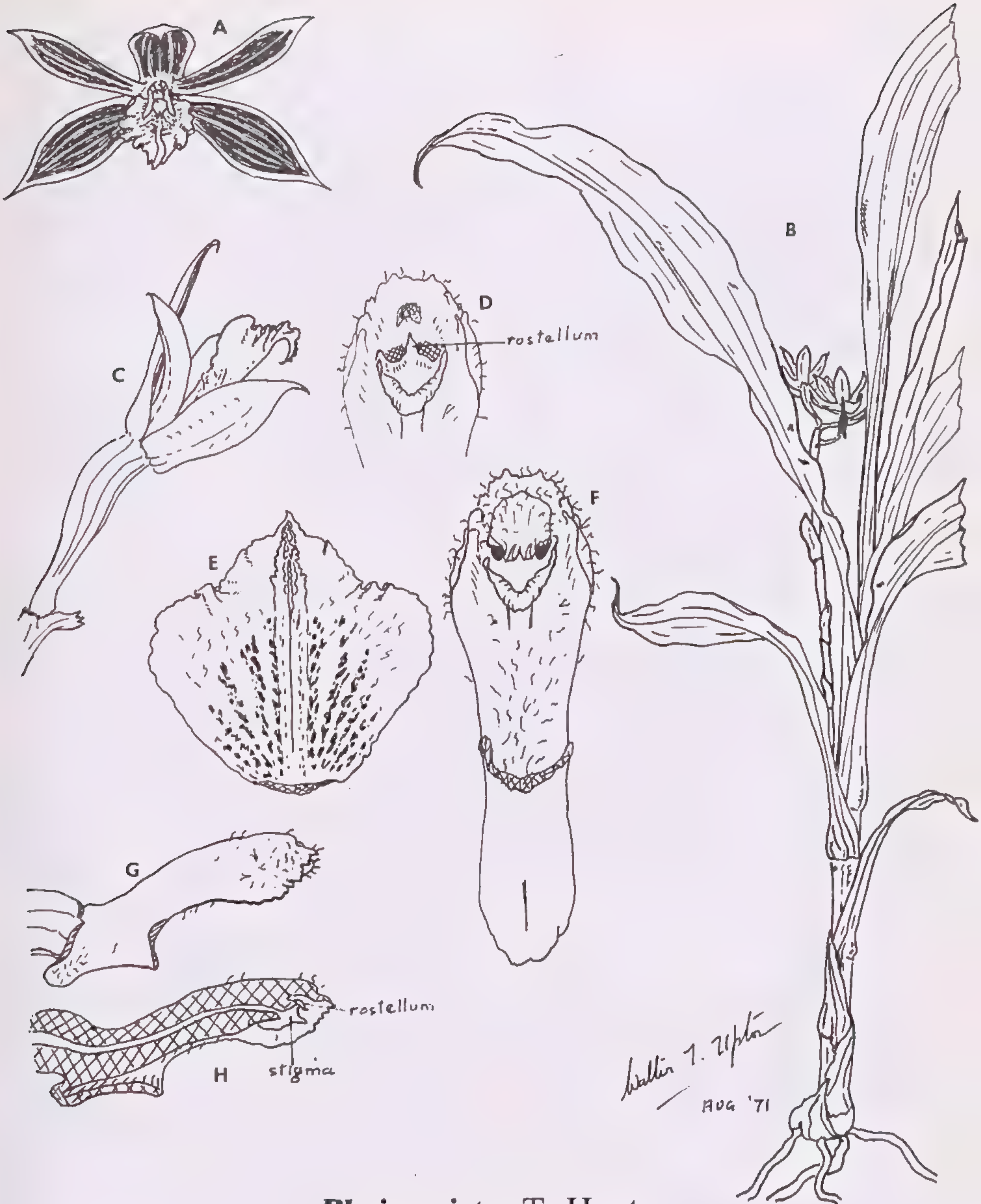


Plate 30: *Phaius pictus.* From a painting by Mair Swann.



Phaius pictus T. Hunt

(A) Flower, front view 1X; (B) Plant 1½X; (C) Flower, side view 1X; (D) Top of column, anther removed 4X; (E) Labellum, pressed flat 2X; (F) Column, front view 4X; (G) Column, side view 2X; (H) Longitudinal section of column 2X.

THE AUSTRALIAN *CADETIA* SPECIES

Roy Gifford
2 Warrah Street, Ettalong, N.S.W. 2257

The genus *Cadetia* contains well over 50 species with the centre of distribution being New Guinea, a few species recorded from Indonesia and four in Australia — all confined to the north-east of Queensland. Two are endemic to Queensland, while two are drifters down from New Guinea, *C. wariana* (Plate 14) confined to Cape York, while *C. taylori* (Fig. 1), the other New Guinea drifter, has the widest range of them all, being found from Townsville to Iron Range in Queensland as well as New Guinea. They are all small plants though they may eventually form large clumps, especially *C. wariana* which is a creeping species and of the four only *C. taylori* will grow in cooler areas without some extra warmth in winter. The others, *C. collinsii* (Plate 13), *C. maideniana* (Fig. 2) and *C. wariana* all need a minimum winter temperature of 12 degrees C. to grow at all well. The genus is closely related to *Dendrobium,* and all the species I grew — I had three or four from New Guinea aside from the Australians — had flowers which, at a glance, closely resembled those of the smaller flowered dendrobiums. The floral colour of all the species I grew was white with a little yellow or pink on the midlobe of the labellum the only break in the colour scheme, though the column in blooms of *C. collinsii* has two purple wings which, due to the small size of the column, are easily overlooked.

I only had one clone of *C. collinsii,* which I got from Ron Collins himself and I have no experience of it in the forest, but Ron informed me that it grew as an epiphyte on small trees on east facing ridges in the McIlwraith Ranges at altitudes below 1,000 metres.

The plants are miniature with virtually no rhizome and form dense clumps of thin upright stems around 20mm high, very slender 2–3mm — each topped with a single fleshy leaf which is dark green and almost oval, some 25–30mm long by 10–12mm wide. There is a large thin bract protecting the emerging growths which persists for quite a considerable time, covering at least half of the stem and which should be watched, for it can provide shelter for scale, etc. and may need to be carefully removed. The blooms are produced singly from the top of the stem and are 5–7mm across, though they do not open very widely. They are white and last a day or so only before closing, for they are self pollinating and the ovary swells. The ovary is itself ornamental, as it is covered with coarse fleshy green hairs, but it becomes a chore removing them after awhile, since every bloom will set a pod and it doesn't help the plants to grow if there are 20 developing seed pods for it to look after.

Under cultivation I grew plants in 50mm thumb pots in a mixture of small seedling grade bark and small gravel in proportion of about 4 to 1. I got my gravel by sieving quarter minus blue metal through a ⅛" sieve and discarding the fines, which gave me a gravel ranging from 3mm to 8mm. This mix worked well for me in a warm house where the temperature was kept at a minimum of 12 degrees C. during winter, fans kept the air moving and I had a micro misting system rigged up for when our summer hot winds sent the thermometer soaring. I fed plants regularly — every second watering — with a weak nutrient and watered everyday in the warm weather, easing off to when I thought they needed it as temperatures started to drop in autumn and winter, roughly twice a week. Cool weather watering depends greatly on one's growing methods and house setup, other growers might need more or less frequent applications of water at this time of year. If plants are happy they make a lot of growths with three or four flushes of growth each year and soon become large enough to produce many blooms at once. They are quietly attractive though one has to be assiduous in removing capsules to keep them flowering. When my plant had become large enough to divide, I tried a couple on small slabs of tree-

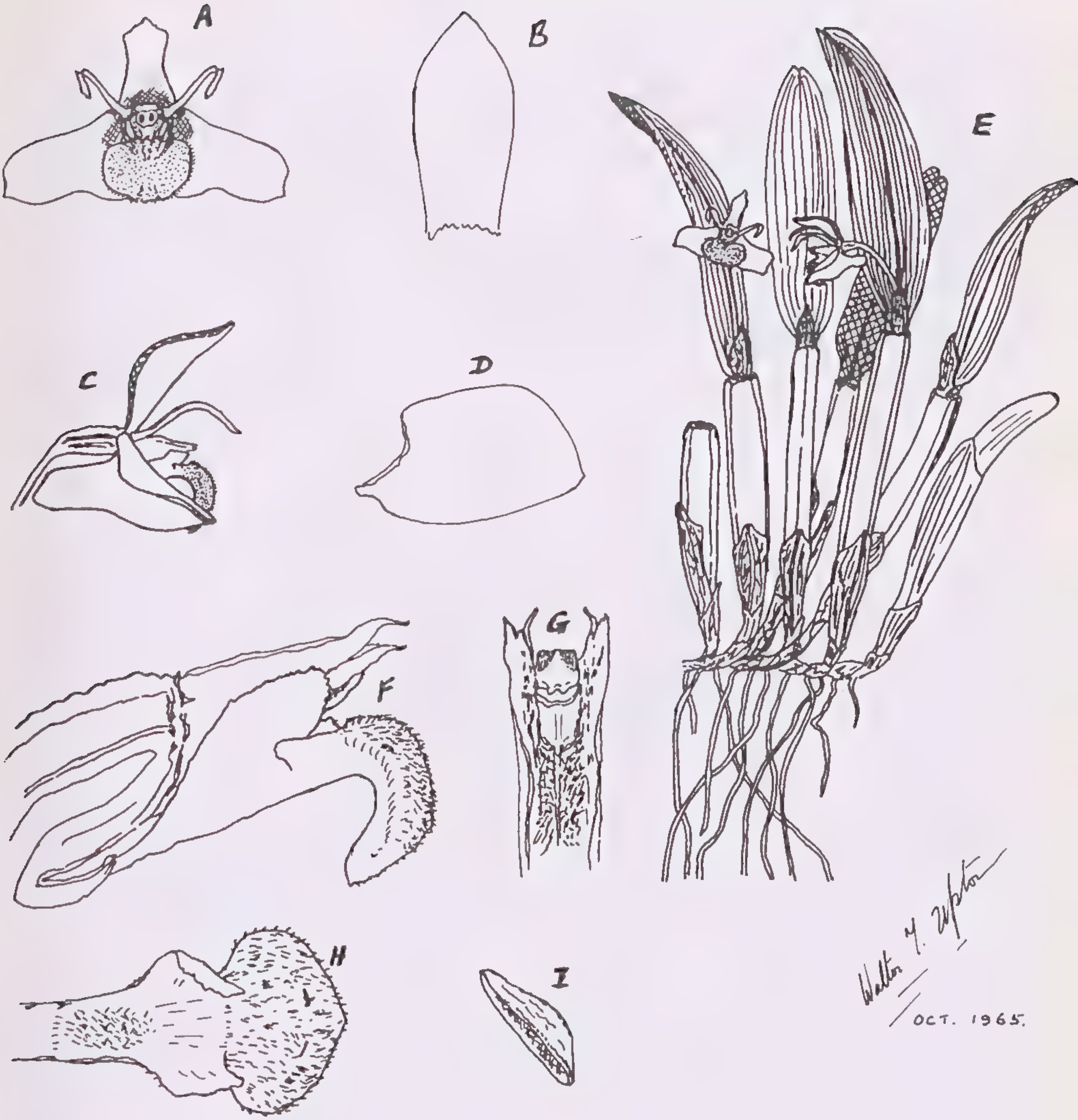


Fig. 1: ***Cadetia taylori*** (F. Muell.) Schltr.

(A) Flower, front view 3X; (B) Dorsal sepal, pressed flat 6X; (C) Flower, side view 3X; (D) Lateral sepal, pressed flat 6X; (E) Plant 1X; (F) Column and labellum, side view 8X; (G) Column, front view 8X; (H) Labellum, from above 6X; (I) Pollinia 30X.

fern fibre *(Cyathea cooperi)* and found that they grew just as well. I used as backing on the slabs a moss I got from Thailand which was quite short (4–5mm) and a velvety green and this made the tiny *C. collinsii* plants look even more attractive when in bloom. With me, plants bloomed at irregular intervals, at any time except mid-winter and I noticed that stems would bloom more than once provided they still had a healthy leaf. A delightful miniature which takes up little room in the warm house and should be an easy bushhouse subject in tropical climes. If a plant comes your way — grab it.

When I lived in north Queensland and was much more energetic, *C. maideniana* was a relatively common plant in the rainforests I used to haunt and I found it from Mt Spec north, wherever conditions were suitable. I never found it growing much above 500 metres, for it is a plant of the warm rainforest and is most often found on trees (or rocks) in rather shady gullies which face east to north. Where conditions were to the liking of the species it would form large clumps and it was unusual to find a largish plant without some flowers regardless of the season, with masses of bloom during late summer, autumn and early winter. Plants have little rhizome with thin woody stems 5–7cm tall and 2–3mm across. They are flattened and wider at the apex than the base, with a loose bract protecting the young growth. This bract is persistent and should be watched lest it provide shelter for bugs. The single terminal leaf is dark green, quite thin and tough, 5–6cm long by 10–15mm across. There is a prominent sheath at the base of the leaf which protects the buds which are usually singles — rarely two — and appear at anytime which suits the plant. Like *C. collinsii* the blooms are short lived and I am convinced that they are also self pollinating, for every flower would develop a capsule which was also covered with short fleshy green hairs. In the forest it was always noticeable that plants carrying lots of seed pods would not be throwing many new growths and the same thing happened under cultivation if one neglected to remove the developing capsules.

Under cultivation at Ettalong Beach (about 50km north of Sydney) plants would only grow for me in the warm house with a minimum temperature of 12°C. in winter. With all species I grew here I always tried a plant in the bushhouse and the unfortunate plant of *C. maideniana* I picked for my trial dropped all its leaves the first cold night in May and never recovered — so warmth in winter is mandatory if the thermometer falls below 12°C. Flowers open widely with the sepals much broader than the petals and are 6–8mm across, pure white except for some faint pink/purple marks on the labellum. I had a lot of plants of this species at one time and found they grew well in very small pots in the same mix as *C. collinsii* and also on slabs of treefern fibre with my short moss as backing. I have them 70–75% shade for I found that more light caused leaf burn even though I had fans running at all times and they responded to applications of weak nutrients with much more vigorous growths — and more of them. I was used to seeing three or four flushes of new growth each year. This species will flower more than once from a growth provided that the growth has a healthy leaf. To my mind not as neat as *C. collinsii,* for plants are taller and tend to open up and sprawl a bit, but still worth a place in any collection of miniatures.

C. taylori is the best of our native species from a horticultural view, for it is a larger plant which makes a very nice specimen when well grown and, more importantly, has larger flowers which last a long time — 5–6 weeks or longer if weather is kind. Plants have little rhizome, forming clumps of stems up to 10cm tall and 5–6mm in cross section, quite rounded with a prominent vertical groove the length of the stem. There is a large papery bract protecting the new growth and as is usual with the genus, this bract is persistent and may need to be removed if it shelters any insect or other pest. The single leaf is terminal, dark green and

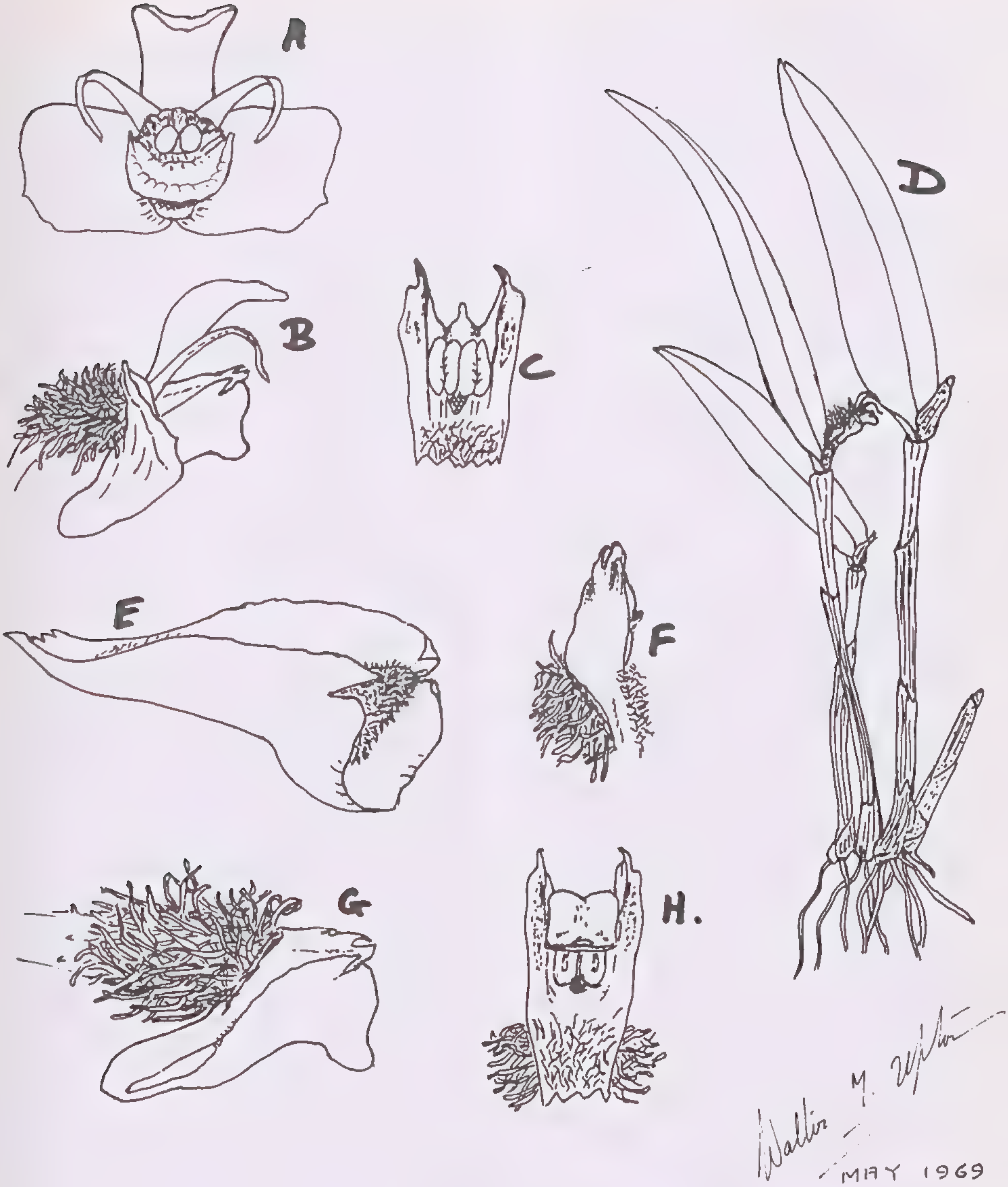


Fig. 2: ***Cadetia maideniana*** (Schltr.) Schltr.

(A) Flower, front view 6X; (B) Flower, side view 6X; (C) Column front, anther removed, pollinia on stigma 9X; (D) Plant 1X; (E) Labellum 12X; (F) Column, side view 9X; (G) Column and labellum, side view 8X; (H) Column, front view 9X.

tough, quite glossy when young but soon becoming dull with age. The flowers appear in ones or twos — mostly ones — from the base of the leaf, where they are protected as buds by a smallish sheath. Flowers are widely opening, 12–15mm across with sepals quite large, the dorsal narrower than the ventrals, while the petals are reduced to not much more than threads. The labellum is three lobed and wide, the mid lobe sharply recurved at the tip, it is very fleshy, densely hairy and coloured yellow commonly, occasionally pink.

Some 45 years ago it was a very common orchid in many areas north of Townsville and I saw it on trees and rocks along the banks of almost every rainforest stream I explored in the northern ranges, with its upper limit around 1,000 metres. It was also common on mangroves in lots of places, in fact the best plants I ever found where on mangroves on Hinchinbrook Island, where they grew in association with *Dendrobium rigidum,* the *Dendrobium* hanging in curtains 20–30cm long and *Cadetia taylori* sitting in large clumps on branches above. I would guess that most of those plants have survived, for the island has long been a National Park, but more importantly, the plants are guarded by the most ferocious biting insects I ever ran across. Be warned if one wants to venture into the mangrove creeks, the sand flies have a wing span of six inches while the mosquitoes are "hunormous" — some mossies stole our tent one night and all came back next day wearing canvas raincoats — I kid you not. We used to scoot across to the island after mud crabs in those day, for they were also the biggest around and we were very young and silly anyway.

Under cultivation *C. taylori* is one of those plants which break the rules — strangely so is *Dendrobium rigidum,* for while both grow literally at sea level in north Queensland, both will grow happily in a bushhouse or cold glasshouse on the Sydney plain. The best plant I have ever seen grown in cultivation was in the care of Alan Rushton, a foundation member of the N.S.W Central Coast Group of A.N.O.S., a very good grower of specimen plants which he kept in superb condition for decades. He had this plant of *Cadetia taylori* which he had grown up to fill a 125mm terracotta squat pot and he would bring it to a meeting three-four times a year, always covered in blooms and never with a leafless stem, or any sign of ill health. Truly a magnificent specimen, grown in a cold glasshouse. When I had a large number of plants I tried to grow one like it and cheated like mad by half filling the pot with several pieces to start, but I could not keep all the leaves intact and my plant always looked scungy by comparison.

I did find, by trial, that this species does much better in a pot — preferably terracotta — than on a treefern slab and I finished with nearly all my plants in pots, in the bushhouse under about 60% shade with a compost of the larger parts of seedling grade bark, obtained by sieving the bark through a 6mm sieve and discarding the fines. To four parts of bark I added one part of gravel and found this a suitable mix for my conditions. I fed regularly with weak nutrients, every second watering in spring and summer and once weekly in cool weather when plants slowed down a bit. I tried to keep the compost always damp but not too wet and added extra drainage by way of broken terracotta in the bottom of pots larger than 75mm. Shade was about 60% and I moved most plants into my warm house in summer (January-February) where I had micro-misters set up to fill the house with a fog of cool water and fans ever running.

With this setup if ambient temperatures climbed above 35°C., I could turn on the misters — the fans only stopped when they blew up and were immediately replaced — and bring the temperature in the house below 30°C. regardless of outside conditions. The misters had nozzles which delivered ¼ litre of water per hour each and were left on until the sun set, with the mist transferring the heat in the house down to the floor and dropping 10°C. from the air temperature in 20 minutes. Very effective, but not to be used as a substitute for the regular watering system, for the amount of water delivered would not supply enough moisture to plants due to be watered in the usual way, though if plants have just **been** watered before the misters are used one could probably delay the **next** watering for an extra day or so. It is important to repeat that misters used in this way, for temperature control in a glass or plastic house, **must** be kept running until the sun goes down, for the sun shining on to wet plants will do a great deal of damage in a very short time and one can even lose plants to scalding and heat stress. This species is very decorative as a well grown specimen, requires no winter warmth if grown on the Sydney plain — or warmer areas, plants are not expensive and should be available at most native suppliers. Every native grower should have a plant or two.

C. wariana is the last of our native cadetias and is a drifter from New Guinea which made its move late and has only managed to make it down Cape York as far as the McIlwraith and Tozer Ranges. I have never seen this plant in the forest, but David Jones reports it "forms dense mats on rocks in or beside watercourses and less commonly on rough barked trees", I presume at lower altitudes on the eastern and north facing slopes. I did acquire several clones of the species and found it easy to grow with a minimum winter temperature of 12°C. It is different from its Australian cousins in that there are definite pseudobulbs, albeit small and the plant has a short rhizome, which lets it creep quite rapidly. The pseudobulbs are 8–10mm long by 3–4mm in cross section, grey-green and shiny and held at about 40° to the substrate. There is a shallow groove the length of the stem and the single leaf is terminal with a very short petiole. It is 12–15mm long by 5–6mm wide, stiff and fleshy, dark green with a pronounced mid rib on the under side. The solitary blooms are produced from the leaf base where there is a minute sheath. Blooms are small, 4–5mm across, open widely with the sepals 3–4 times wider than the petals — for the size of the blooms the petals are broad for a *Cadetia* species. Colour is the usual white, the tip of the labellum bright orange or clear yellow — though very small this coloured spot stands out on the flower.

In the warm house I found plants did poorly in pots, mainly, I think, to the difficulty in providing a sufficiently shallow container and also it is very hard to secure such a small plant firmly in a pot without burying it. Anyway they grow very nicely on treefern slabs, so why worry? I mounted plants on treefern slabs roughly 10cm square with my Thai moss as backing, fed every second watering with weak nutrients and gave plants 60% shade with fans always running, the temperature never below 12°C in winter.

Under this regime plants thrived and became nice specimens in a couply of years, with flowers appearing in regular flushes from spring to late autumn, tapering off to the occasional bloom in winter. Flowers last a week or so in good weather and an established plant with 20 pure white flowers — each having its bright orange or yellow spot — on a grey-green plant against a background of emerald green velvety moss is very attractive and gives one a feeling of great satisfaction. Should be in the collection of every species grower with a warm house in temperate areas or a shady bushhouse in the tropics.

For authors, synonymy, etc., see References.

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THIRD AUSTRALASIAN NATIVE ORCHID CONFERENCE AND SHOW TO BE HELD IN ADELAIDE IN 1996

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The Native Orchid Society of South Australia (N.O.S.S.A.) has been chosen to host the Third Australasian Native Orchid Conference and Show in 1996. N.O.S.S.A. has chosen the beautiful Flinders University as the venue for the Conference. Elevated on 160 hectares, just 11km south of the centre of Adelaide, Flinders University offers excellent conference and show facilities while affording splendid views over land and sea. (Plates 31 and 32).

Although the campus is large, the buildings in which the conference events will be held are essentially adjacent to each other. A pharmacy with film processing facilities, a bank and a Post Office are located within a few metres of the conference facilities. The campus will not be heavily populated with students as the conference and show will coincide with an end of term two week break. The Flinders campus is well served with a public bus system which links the conference facilities with Adelaide's city centre and distant suburbs and there is more than adequate on-campus car parking. The University is near numerous Conservation Parks in which there will be a diverse abundance of native terrestrial orchid species in September.

Some 125 one- and some two-bed apartments on-campus (University Hall) are being made available for the duration of the conference. It is only a 10 minute walk along a footpath that winds through a lovely "scented" pine forest and across a ravine which offers excellent views of Adelaide's beaches, from University Hall to the actual conference facilities. Off-campus accommodation can be obtained in nearby motels and caravan parks, from beach-side hotels, caravan parks and units located within a 20 minute drive of the conference facilities and from city hotels, only 25 minutes away.

Adelaide has much to offer interstate visitors. The Adelaide and Mount Lofty Botanic Gardens (the latter particularly spectacular in September), the award winning Bicentennial Tropical Plant Conservatory, the Zoological Gardens, Science Park, the Barossa Valley and Clare Valley wineries, shopping in the historic town of Hahndorf, the Cleland Native Wildlife Park, the Warrawong Sanctuary in which native marsupials (including platypus) can be seen during dawn and dusk tour and the Monarto Wildlife Park are just a few.

The agenda will be carefully organised to ensure as many registrants as possible can attend the maximum number of attractions. N.O.S.S.A. wants to make the Third Australasian Native Orchid Conference and Show a truly Australasian event with all member societies represented.

The Conference and Show will take place between the 25th and 30th of September with the 25th (a Wednesday) being devoted to setting up the Native Orchid Show. A Cocktails/Ice Breaker Evening will be held on the 26th and Lectures/Talks will be held on the 27th and 28th of September.

N.O.S.S.A. promises an exciting, rewarding and fun agenda, both technically and socially and have planned field excursions which will offer participants a chance to see a large number of South Australia's native orchid species within close proximity of Adelaide. ❦

GROWING THOUGHT

Generally the leaves of a plant are placed so as to expose as large a surface of each leaf blade to the sunlight as possible. They require this light for their function of manufacturing food for the plant. Place your orchids as advantageously as possible to accomplish this. ***Do not overcrowd.***

Ed.—This is a paper submitted by one of the successful student judges participating in the A.N.O.S. Judging School held in Brisbane recently. All student judges are required to present a paper as part of the written examination.

AUSTRALIAN NATIVE *CYMBIDIUM* SPECIES & HYBRIDS

Gary Schuhmacher
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The genus *Cymbidium* consists of approximately 50 species, with most species found in South-East Asia and their distribution extending from north-west India to Japan southwards, throughout the Malay Archipelago to the north and east of Australia.

Three small flowered tropical and subtropical species are found in Australia, all of which are endemic and belong to the Section *Austrocymbidium*.

This section itself was established by Schlechter in 1924 and consists of six species, with individual species found growing in parts of Malaysia, Sumatra, Java, in the top end of Australia from north-western Australia through to the Cape York Peninsula and on the east coast of Australia as far south as Eden in southern New South Wales.

The Australian native *Cymbidium* species are geographically isolated from the rest of the species in the Section *Austrocymbidium,* that is to say, the distribution of these species does not overlap with the distribution of the others *(C. chloranthum, C. elongatum, C. hartinahianum)* and there are no species within this section found in New Guinea.

This has led to the belief that cymbidiums spread from Java to Australia at a time when the land masses of Java and Australia were geographically closer, prior to drifting apart.

The latter climatic changes and the subsequent reduction of rainforests in the northern parts of Australia are likely to have necessitated the adaptation of some of the individual species within this section, to environments within their developing geographical confinements.

Within the Section of *Austrocymbidiums* there are two groups distinguishable by the presence or lack of pseudobulbs.

Cymbidium canaliculatum and *C. madidum* belong to the first group, by forming large ovoid pseudobulbs, with *C. suave* having slender stems instead and therefore belonging to the latter.

All Australian native *Cymbidium* species are pollinated by small native bees. Also, they are diploids with a chromosome number of 40.

Cymbidium canaliculatum Robert Brown

Common Names: Black Orchid, Channel Leaf Cymbidium.

Distribution: *C. canaliculatum* is the widest distributed *Cymbidium* species in Australia, predominantly found growing in warm inland areas from the Kimberleys in Western Australia, the Northern Territory, to Cape York, Queensland with exception of the arid south-west corner, south to the Hunter River in north-eastern New South Wales.

Habitat: *C. canaliculatum,* easily recognisable by its stiff, curved leaves, is an epiphyte mainly found growing in hollows in tree trunks and branches of *Eucalyptus* and *Melaleuca* trees, with its root system extending deep into rotting wood. It withstands strong direct sunlight, temperature extremes and drought. Although the plant prefers warm inland areas, it can also be found near the sea in the tropics and positive identifications have also been reported in various coastal regions of south-east Queensland.

Cultivation: Although it is quite possible to successfully maintain this species in cultivation, problems not being able to do this easily are partly the result of a lack of one of its main natural sources for nutrients, namely the decaying heartwood. For this reason, decaying eucalypt heartwood chips as part of the potting mixture is considered beneficial.

Limiting water is crucial, as this species is drought-resistant as a result of very efficient channelling of water (even just dew) via its leaves to the root system. Therefore over-watering not only by man but also as a result of frequent coastal showers, particularly during colder periods, needs to be avoided, at the same time providing good air movement to reduce humidity. Bright light is essential. An airy glasshouse probably provides the ideal environment near the coast. The plant prefers cool and moist conditions near the root system and it is therefore suggested that besides using hollow logs, the use of terracotta pots sealed on the outside to prevent drying out, is advantageous to simulate this.

C. canaliculatum resents disturbance of its root system. It is therefore advisable to start with small plants and to pot them on carefully. The application of fungicides after a disturbance of the root system, although preventing infection, at the same time is detrimental to the presence of the wood-rotting fungus, which is necessary in the process of breaking down the heartwood to provide the food source for the plant.

Flowering Characteristics & Varieties: *C. canaliculatum* develops almost erect to pendulous racemes up to 35–40cm long with up to 60 or more widely spreading flowers. The flowers are between 1.5–5cm across and come in an amazing variety of colours. Based on the colour of the perianth segments, a number of varieties have been given botanical names:–

C. canaliculatum var. *barrettii* is described as pale greenish-yellow variety from the Northern Territory.

C. canaliculatum var. *canaliculatum* forma *inconstans* includes most shades of green with red-brown spots and blotches on the perianth segments. It is the common form in Queensland and New South Wales.

C. canaliculatum var. *canaliculatum* forma *aureolum* is basically bright yellow-green in colour. This form is confined to the parts of New South Wales.

C. canaliculatum var. *marginatum* forma *fuscum* includes all shades of reddish-brown flowers with a narrow greenish margin.

C. canaliculatum var. *marginatum* forma *purpurascens* is the north Queensland form distinguishable by its bright magenta colour.

C. canaliculatum var. *sparkesii* is the best known outstanding variety found north of Townsville, which has vibrant purplish-brown, maroon flowers, almost appearing black, suffused with pink on the margins.

There is also a rare albino form of this variety which has clear apple-green segments and a white labellum.

Cymbidium madidum John Lindley

Common Name: Native Cymbidium.

Distribution: *C. madidum* is mainly distributed along the coast of Queensland almost from the tip of Cape York south to the Hastings River in north-eastern New South Wales.

Habitat: This species is easily recognisable by its large pseudobulbs. It grows in rainforests, open forests with high rainfall and swamps, as it generally prefers moist habitats and requires less bright light. There it can be found on trees as well as boulders and rocks where it grows in clumps and frequently in the company of ferns.

Cultivation: *C. madidum* is the easiest of the Australian native *Cymbidium* species as far as maintaining it in cultivation is concerned. Based on its natural habitat, it is generally considered to prefer cool, humid conditions with lots of air movement.

My wife and I have an extraordinarily thriving and well flowering plant. We potted it on in a mixture of predominantly peanut shells with pine bark, charcoal and polystyrene approximately 12 months ago. It receives the same applications of fertilizers and water as do our *Dendrobium* and *Sarcochilus* orchids in the bushhouse growing in close proximity.

Flowering Characteristics & Varieties: This species produces up to 60cm long arching to pendulous racemes with up to 60–70 flowers, which are generally pale-green to brownish green and 2–3cm across. There is also a yellow-green form which is considered rare. *Cymbidium madidum* var. *leroyi* is the only variety which has been named and it is recognisable by its erect margins of the mid-lobe of the labellum. It originates from north-eastern Queensland between Cooktown and Cairns.

Cymbidium suave Robert Brown

Common Names: Snake Orchid, Sweet Cymbidium.

Distribution: *C. suave* is distributed in a narrow coastal band on the eastern side of the Dividing Range reaching from Cooktown in north-east Queensland to Eden in south-eastern New South Wales.

Habitat: This species is the smallest of the three Australian native *Cymbidium* species. As mentioned earlier, it differs from the others by having slender stems, instead of ovoid pseudobulbs and has a "grassy" appearance. Similar to *C. madidum,* it is found growing in areas with high rainfall, although it prefers somewhat drier conditions and bright light. Its common habitats are open forests and fringes of rainforests, where it grows mainly in hollows in branches and trunks of *Eucalyptus* trees as well as on rotting stumps and logs. The species relies on an extensive root system penetrating deep into rotting heartwood of *Eucalyptus* trees. This species also grows on other host trees where it can form an extensive root system around the tree.

Cultivation: Once again this is a species which poses problems in cultivation. Part of the problem is the above mentioned reliance on an extensive root system and its subsequent suffering in case of damage to it, which, more often than not, is fatal. The plant appears to depend heavily on nutrients being supplied this way, in particular, as it lacks pseudobulbs and cannot fall back on this resource of stored energy whilst trying to recover.

Small plants are much easier to manage and should be potted on whilst taking great care not to damage the root system.

C. suave prefers cool and moist conditions near the root system and it resents prolonged dry periods which inevitably would result in a loss of that moisture around the roots. It is therefore advisable to use hollow logs or terracotta pots and to regularly water at the base of the plant. When using terracotta pots, it is necessary to use the deepest pot available in order to make allowance for the extensive root system. Drill extra holes along the side of the pot to assist air circulation.

In order to provide the earlier mentioned natural food source, a coarse mix of rotting eucalypt heartwood chips and charcoal is beneficial. However other potting media are also said to have been used successfully.

Roy Gifford has described a method which he saw very successfully being used by Judge Byrne, using simply cylindrical wire baskets, made from bird wire and reinforced with stakes. These were lined with bark from the tree where the plant has been collected. The process was repeated whenever the plant required potting on using larger and larger baskets.

Flowering Characteristics and Varieties: Racemes are up to 25cm or more long and are arching to pendulous. The numerous flowers are 1.5–3cm across and are commonly light to olive-green or brownish-green with a bright yellow or greenish labellum and very fragrant.

HISTORY OF AUSTRALIAN NATIVE *CYMBIDIUM* HYBRIDS

The first Australian native *Cymbidium* hybrid was *C.* Little Black Sambo, a cross between *C. canaliculatum* and *C. madidum,* registered by Cooper in 1966.

Since then the following registrations have been carried out: *C.* Kuranda *(C. madidum* X *C. suave)* registered by Greenoaks in 1972 and *C.* James Webeck *(C. canaliculatum* X *C. suave)* registered by Webeck in 1989.

In the first two crosses, *C.* Little Black, Sambo and *C.* Kuranda, the ease of culture of *C. madidum* has been passed on to its progeny.

ACKNOWLEDGEMENTS

Special thanks to Dr André Millar and Ed Thorogood for providing articles on the subject.

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Plate 31: Flinders University.

Plate 32: Flinders University.

Venue for the Third Australasian Native Orchid Conference and Show.

Plate 33: *Dendrobium speciosum* var. *hillii,* in situ.
Photo: T. Gregory.

Plate 34: Dead, *Dendrobium speciosum* var. *hillii.*
Photo: T. Gregory.

WAFFLINGS OF AN ORCHID WANDERER

Ted Gregory
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It seems only yesterday that Joe Betts was editor of *The Orchadian* and I was a farmer-contractor in the Manning Valley in N.S.W.

I remember at one stage Joe and Phil Collin were at our place and Joe said why don't you put pen to paper for me? This I did with great trepidation, thinking who the heck would ever bother to read anything scribbled down by a bushie born on the shady side of Mt Coneac.

But lo and behold, I never got shot over the first article (if anyone shot at me thankfully they must have missed) and I went on to write for a few years for the old rag and enjoyed every minute of it.

Looking back now I don't know why I ever stopped; guess it was just lack of time more than lack of material. Perhaps it was just apathy on my part or not enough days in the week. However after some nudging and pushing by Wally Upton and Co., I've got a few hours to spare and here we go again! As something is wrong with the vacuum between my ears at the moment, this will just be a few thoughts and anecdotes on various things that have caught my imagination over the months, or years, or what have you.

Barbara and I have just returned from a trip from our home here, down to Walcha to Nowendoc to Gloucester; a spot that I guess will always be home to me. To see the valleys of the Barnard, Barrington and Gloucester Rivers at leisure did us both a great deal of good.

To see all the *Dendrobium speciosum* var. *hillii* (Plate 33) on the casuarinas along Mountain Creek brought back a ton of memories of days spent there with our children years ago.

The main reason we spent time there on this trip was to get photos of the local orchids in situ. Like a lot of growers I have a houseful of slides taken in bushhouses but very little on the orchids doing their own thing in their own habitat. The light wasn't the best and a 500mm lens would have been better than my 220mm but here's hoping. I have not got them back as I write this, so touch wood.

One sight that did perturb me was a fair few adult clones of *D. speciosum* var. *hillii* dead on the casuarinas (Plate 34). I'm talking of 30–40 cane plants, not seedlings. I cannot say that I've ever seen more than an odd clone dead here and there over my years in the bush. Perhaps it could have been caused by the prolonged drought in the area, but as these casuarinas are all growing along the watercourse, it would hardly be the dry alone. To add to the mystery the hundreds of surviving clones all looked as healthy as could be, there did not appear to be any sick clones, just the completely dead ones here and there.

I'm happy to say there does not appear to have been a great deal of thievery there over the years since I have been away; most of the clones I knew are still growing happily. Though I must admit I saw one blatant example of greed; quite a large myrtle had been chainsawed down into the creek for the *D.* X*gracillimum* on it. Everything else had been left to rot. This had occurred a couple of years ago by the condition of the tree.

ORCHIDS ON TAMBORINE MOUNTAIN

Whilst still on the subject of orchid thievery I must say the parks on Tamborine Mountain are fairing very well. I don't know whether this is due to diligence of the local rangers or a general change in attitude by the general public, here's hoping it is the latter.

I like to take hours off late October or early November and go into the park to photograph the *Sarcochilus fitzgeraldii,* which can be easily seen from the walking trails when in flower. In the time I have been doing this I can say I only know of one clone having been taken off its rocky home. This is great considering hundreds of visitors go though these parks every week.

There has been a magnificent flowering of dipodiums on the mountain over the past few weeks, both *Dipodium pulchellum* and *D. varigatum;* we have a couple growing within two metres of our house block. Some of the deep black-red ones are a magic colour; wish I could breed a *Dendrobium kingianum* that colour! The attitude of a large percentage of our public really astound me, they just blunder by these incredible plants hardly ever seeing them, I have shown them to many who had walked by them for years without ever seeing them.

It is a pity that herbicides are so widely used here, especially around the rose gums and tallowoods, where these plants are seen at their best if left alone.

ORCHIDS AND PESTS

Everyone of us who has anything to do with orchids, or any form of gardening for that matter, has been plagued by pests of some sort or other over the years and as we all know everyone is trying to get away from using sprays and so on that kill the goodies as well as the baddies. The following information shows the trend that is going on worldwide; hopefully this type of control will save me killing my pet frogs and lizards when I get a build up of nasties in the nursery.

Both these snippets are per courtesy of Greenworld, one of Australia's leading horticultural magazines. I will acknowledge the original source after each piece.

Biological Fungicides for Phytophthora Control

A new mycofungicide, Trichoderma harzianum, (commercially known as Supresivit in the Czech Republic where it was developed), has shown good activity in controlling damping off caused by pythium, rhizoctonia and phytophthora.

The trichoderma colonises in the media where plants are growing and prevents infection by pathogens and parasitise pathogens which may be present.

Extensive trials have been conducted in the Czech Republic on a range of plants.

Supresivit is recommended as a preventative drench to be used prior to rooting cuttings of tissue cultured plantlets.

Per Flora Culture International (U.S.A.) November, 1993.

Wonderful what is going on in the plant world and where it is going on, isn't it? The next one is just as interesting too.

Biological Control of Root Rots

Mycostop, developed by Kemira Biotech of Helsinki, Finland is a wettable powder containing Streptomyces bacteria isolated from sphagnum peat.

It colonises plant root zones, secretes biochemicals to inhibit fungus growth and produces pathogen-harmful enzymes.

Mycostop controls fusarium, alternaria and phomopsis and has been known to suppress phytophthora and botrytis.

Grower Talks (U.S.A.) November, 1993.

Too many big words for me! Wishing you all good growing.

MEMORIES

Marian Cail
35 Boronia Street, East Gosford, N.S.W. 2250

I am not by any means a scientific orchid grower. I just grow plants — any kind. I have always liked orchids, without knowing them as such or their names. We came to the Gosford district in 1923. Our house was built on top of a hill, mostly clay, not good for cultivation, but there were lots of red gum trees and others, like mahogany and blackbutt. In spring there were masses of ground orchids, *Diuris;* a spotted red one, locally called "Snake Orchid"; sun orchids, including the lovely lilac one with the grey back and a perfume.

We used to pick them for the house as there were no other flowers in the area except gum tree blossoms. As my grandmother taught me, I used to press some of the flowers and also draw them, mostly in pencil. Unfortunately those all got burnt in the 1928 fires which burnt all the big trees and the bears.

The tops of the hills on the sandstone rocks were massed with rock lilies, *Dendrobium speciosum,* nearly always on top or on the north-east side; very rarely on the south or west side unless well protected.

Wherever they grew they were accompanied with a fern, like a large hare's foot fern. Where I live now there is a large clump about 5'6" x 6'7" of *D. speciosum* almost covered with this fern at this time, late summer, to early winter. I have observed that these two plants grow together, one protecting the other.

Now, when the fern is most prolific, the orchid is putting out new shoots and the fern protects them from the hot summer sun, the wind and hail and heavy rain if we get a storm. The orchid in turn, protects the fern, as it grows **under** the roots of the orchid.

I have also found that they like mushroom compost. They were here when we bought the place in 1973, planted at the base of a treefern out in the open. They got watered when it rained as we only had tank water. It never occurred to me to feed them until I was putting compost round some azaleas about three years ago. I cannot say that it has improved the flowering as they were always flowered well, but I think it keeps them cooler in the summer and any planted out do grow quicker and better.

AUSTRALIAN NATIVE ORCHID HYBRID REGISTRATIONS

(New registrations from lists in *The Orchid Review,* January/February and March/April, 1994):–

Name	Parentage	Registered by
Dendrobium		
Angellene	Aussie Angel X Ellen	N. Roper
Bolero	Ku-Ring-Gai X *Fleckeri*	R. & D. Sheen
Cheryl Patricia	Joy Wray X *speciosum*	J. Andrews
Double–A	Amber X *adae*	D. & M. Crawford
Double Grace	X*gracillimum* X Double Two	D. Carr
Elegant Falcon	Elegant Heart X *falcorostrum*	W. T. Upton
Eungella	*speciosum* X Karen Nair	A. Blewitt
Jeenga	Ellen X Omega	N. Roper
Megan's Charm	*johannis* X *bigibbum*	Hoosier (O/U)
Memoria Bill Jefferies	Colonial Surprise X Hilda Poxon	Florafest (I. Klein)
Native Falcon	Native Gold X *falcorostrum*	So. Cross (Australia)
Native King	Native Gold X *speciosum*	So. Cross (Australia)
Pauline Maria	*canaliculatum* X *bairdianum*	R. Currell
Rex's Delight	David Baver X *speciosum*	G. Rex
Rowena	Star of Riverdene X Hastings	R. & D. Sheen
Star White	Duke X *speciosum*	W. T. Upton
Toto Aiba	X*superbiens* X *nindii*	W. Bandisch
White Mist	Jombock X Harold Hirsh	W. T. Upton
Yondi Sunshine	Eureka X Lynette Banks	S. Batchelor
Parachilus		
Selmann	*Prcls.* Selwyn X *Sarco. hartmannii*	W. T. Upton
Sarcochilus		
Anglesea	*fitzgeraldii* X Cherry Derham	Florafest (L. Fagg)
Bernice Klein	Heartlight X *fitzgeraldii*	Florafest (I. Klein)
Bon Bon	*hartmannii* X Verolica	Florafest (C. Wuth)
Cherry Derham	Mavis X Lois	Florafest (M. Derham)
Cream Puff	Memba X *weinthalii*	Florafest
Dorrigo	*falcatus* X Melba	Florafest (L. Fagg)
Ivory	Wandjina X Melba	Florafest (L. Fagg)
Judy's Wine	Judith X *weinthalii*	Florafest
Lorraine Fagg	Verolica X *fitzgerladii*	Florafest
Memoria Leney Smith	Fitzhart X Mavis	Simpson Orchids
Millie	Mavis X *hillii*	W. T. Upton
Otways Star	Arcadia X *australis*	Florafest (L. Fagg)
Otways Sunset	Fitzhart X *australis*	Florafest (L. Fagg)
Tiffany	*falcatus* X Elizabeth	Simpson Orchids

AROUND THE GROUPS

NEWS FROM THE NATIVE ORCHID SOCIETY OF SOUTH AUSTRALIA

Robert J. Bates
8 Buckley Crescent, Fairview Park, S.A. 5126

WORK OF THE CONSERVATION GROUP

The N.O.S.S.A. Conservation Group led by Karen Possingham has done a marvellous job since its formation and emphasises that conservation is one of the major thrusts of the Native Orchid Society of South Australia.

At least 40 South Australian orchid species are threatened with extinction and perhaps as many have already become extinct. We will not let what we have left be lost without a fight.

Activities of the group:–

1. Lobbying to save remnant native vegetation. N.O.S.S.A. has links with other conservation organisations such as the Native Conservation Society of S.A., the Conservation Council, Friends of Parks groups and the Threatened Species Network. We have written letters to assist with various campaigns to save remnant native bush and met with the heads of various departments involved with land management. So far we have saved an area of bushland from being subdivided, had areas added to the reserve network and prevented a new highway from being built through an endangered habitat.
2. Orchid surveys and park management. The group recognises the importance of "hands on" conservation and has adopted sites in at least two conservation parks to weed and monitor orchid populations. The primary object of this work is to follow the response of orchid populations to the removal of weeds such as Boneseed Daisy, *Chrysanthemoides monilifera.*
3. Threatened species — The group is involved in a recovery programme to save the endangered Spider Orchids *Caladenia behrii, C. gladiolata* and *C. rigida* all endemic to South Australia. Weeding, fencing, hand pollination, flasking of seed, re-introduction of the species into areas from which they have been lost, public education and future management strategies are all part of the work which is being funded by a Government grant through the Endangered Species Unit in Canberra.
4. R. S. Roger's Orchid House — Our members help out with management of this project at the Black Hill Flora Research Station (part of the Adeliade Botanic Gardens). Over 200 species of native Australian terrestrial orchids are being grown here including threatened species such as *Pterostylis arenicola* which is being managed and grown from seed by a team led by Manfred Jusaitis and Birgita Sorenson.
5. Education — An information pack on native orchids with slides has been produced and is specifically designed for schools. We need to further educate the public to see the value of conservation and its role in preserving orchids in their natural habitat. The Conservation Group sets up a display at N.O.S.S.A. shows to emphasise this work.
6. Surveys — Each year since 1987 the group has surveyed a different conservation park, mapping the population of all orchid species, recording all plant species in these parks and publishing results in booklet form. These booklets are known to have the most comprehensive plant lists for any conservation parks in S.A.

The Native Orchid Society is extremely proud of the work being done by its conservation group.

KABI GROUP INC., QUEENSLAND

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WOLLONGONG & DISTRICT NATIVE ORCHID SOCIETY

Spring Show will be held at the Wollongong Botanic Gardens 16th, 17th and 18th September, 1994.

NOTICE FROM A.N.O.S. COUNCIL

THE AUSTRALASIAN NATIVE ORCHID SOCIETY INC. ANNUAL GENERAL MEETING AND ELECTION OF COUNCIL AND ADVISORY COMMITTEE MEETING

The above meetings of the Society will be held at the Gosford R.S.L. Club, 26 Pacific Highway, West Gosford on Saturday 6th August, 1994. Hosted by the A.N.O.S. Central Coast Group. Morning tea will be served from 9.30 a.m. and lunch will be available at the club.

The A.G.M. will commence at 10.00 a.m. and the Election of Council for 1994–1995 will take place.

The A.N.O.S. Advisory Committee Meeting will be held in conjunction with the above, commencing after the closure of the A.G.M.

A.N.O.S. Groups and associated Native Orchid Societies are requested to advise the Secretary the names of their delegates to the Advisory Committee Meeting or to nominate proxies (if required) before 30th July, 1994.

NOMINATIONS FOR ELECTION TO COUNCIL

Nominations for the election of A.N.O.S. Council are called for. These should be signed by a member of the Society, countersigned by the nominee accepting nomination and lodged with the Secretary no later than 30th July, 1994. Positions to be filled are: President, Vice-President, Secretary, Treasurer, Editor plus seven Councillors.

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If you are, you will not receive the September issue of *The Orchadian.* The Membership Renewal Application was included in the March issue. If you are unsure of your financial status, check the address label of this issue.

94 – (followed by your postal area code number) means Renewal necessary. Financial to 30/6/94

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If you have misplaced the Membership Renewal Application, another is enclosed. Send this and your remittance or credit card authorisation to:–

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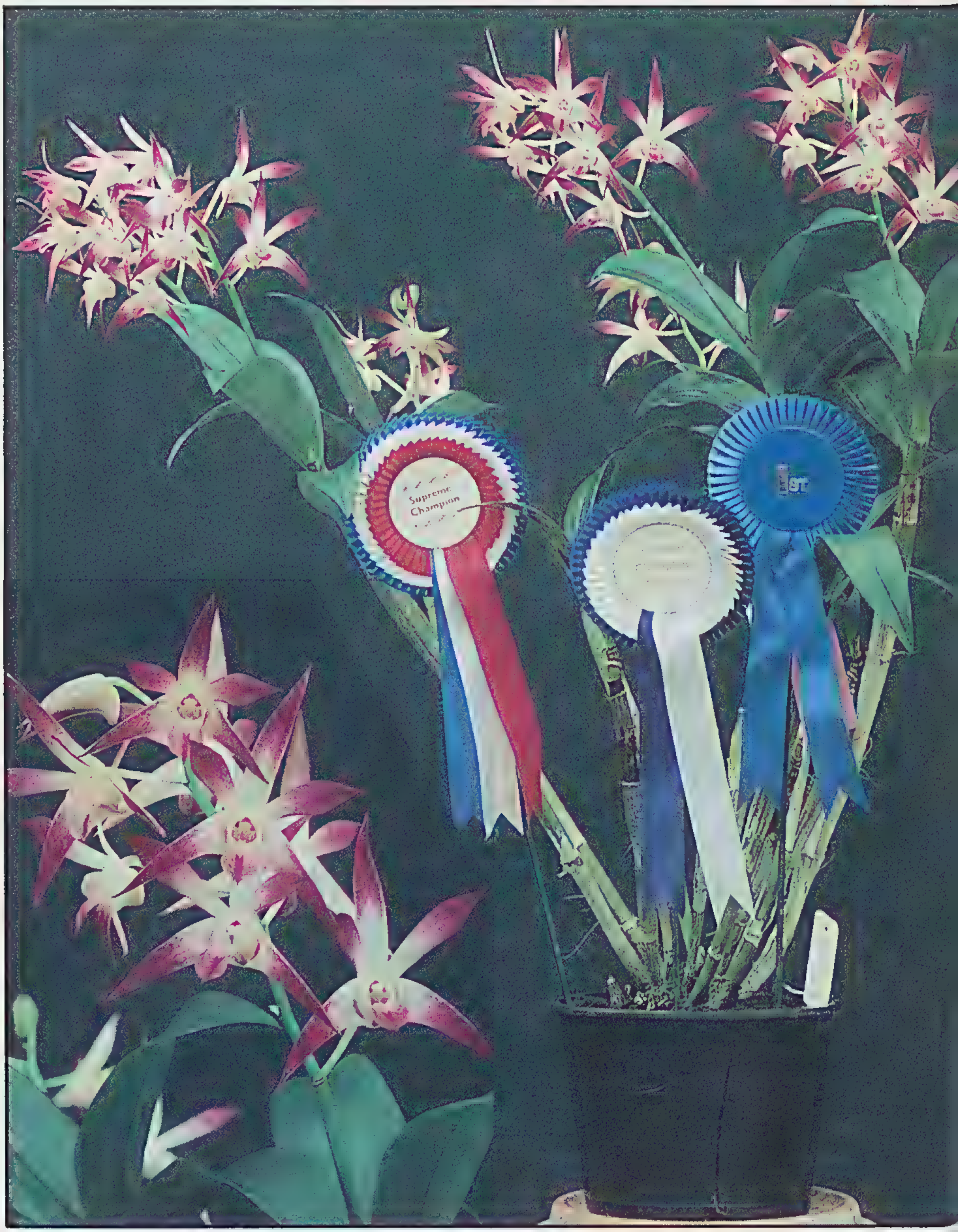

Dendrobium Elegant Heart – Owner and grower John Roberts. Grand Champion of Manly-Warringah Orchi
Society Spring Show 1993. A clone of the original cross registered in 1986. Photos: D. Titmus

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TALKING POINT

A Message from our Immediate Past President

I would like to take the opportunity to sincerely thank everyone for their support during my three years as Council President.

My special thanks must go to Wal Upton for his wonderful effort in getting *The Orchadian* back on time. With the help of the A.N.O.S. Central Coast Group, *The Orchadian* comes out on time and is full of interesting articles. I hereby make a special request for all of you to help Wal keep this publication going. He can always do with articles. Please give due consideration to helping. It only takes a small amount of time to write an article about our hobby. Thank you Wal, Jill and the Publication Committee of the Central Coast Group.

The highlight of my reign was the Second Australasian Native Orchid Show and Conference, hosted by the Native Orchid Society of Toowoomba Inc. under the guidance of Clarrie Wuth, the Group put on a wonderful show with top line speakers and good social functions. All who attended, have expressed the same feelings. N.O.S.T.I. set a very high standard for any other Group to follow. Having made that statement, I would like to say, that the keenness shown by the Native Orchid Society of South Australia, the elected host for the Third Conference and Show, augers well for them to go one better. During May this year, John Turner, Bob and Janet Napier and I, visited South Australia to discuss the proposed conference and show. To my surprise and delight, N.O.S.S.A. are well advanced in all aspects. All goes well for 1996.

Under the guidance of John Hazelwood, we now have another Judging Panel. It is in the state of Queensland. There are expectations that there will be another two additional panels formed in the near future, with South Australia and Western Australia seeking information of setting up panels. Not too far away, we may even have one formed in New Zealand. One of our members John Creegan from Christchurch in the southern island travels to Sydney once a month to attend the A.N.O.S. Judging classes.

All our Groups seem to be running smoothly. A number of them have increased their membership and by reports are financially sound. I would like to make a special appeal to you to help your own Group. That special effort will reap much benefit for yourself and your Group. Support your local Group and volunteer for a position on the Committee.

In conclusion, I would like to thank all those members who have served some portion of time on the Council's Management Committee. Especially the two main achievers Bob and Janet Napier. I am now going to retire to the back bench on Council.

Barry Collins
Immediate Past President ❦

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THE ORCHADIAN

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THE UNDERGROUND ORCHID IN SOUTH AUSTRALIA

G. E. Carne
118 Hewitt Avenue
Toorak Gardens, S.A. 5065

In 1993 the Native Orchid Society of South Australia (N.O.S.S.A.) accepted a challenge put forward by life member Les Nesbitt and initiated a search for *Rhizanthella,* the Underground Orchid, in South Australia. This search is being intensified in 1994.

There are only two "subterranean" orchid species known in the world: *R. gardneri* (Plates No.'s 3 to 7), endemic to south-western Western Australia and *R. slateri* (Plate No. 17), known only from a very few plants which have been observed in northern New South Wales and Queensland. The genus has not been positively identified from South Australia, although several unconfirmed sightings of this very "rare" and unique orchid have been recently reported to N.O.S.S.A.

Rhizanthella is entirely subterranean, it even flowers beneath the earth's surface. The only parts of the orchid which are exposed are the apices of the involucral bracts which break a very small hole in the soil surface. These bracts almost completely enclose the flowers, with just a small opening to allow entry for pollinators. They are, however, generally concealed by leaf and other ground litter and are therefore not readily obvious. Further hindering detection, individual plants of *Rhizanthella* do not flower every year. Localities from which the genus is now known in Western Australia were first revealed accidentally (in 1928) through the ploughing of fields; in New South Wales the orchid was first unearthed in 1932 by an amateur naturalist who was "digging-up" a *Dipodium punctatum,* a saprophytic orchid commonly known as the Hyacinth Orchid, again an accidental finding.

As species of *Rhizanthella* have been found in both Western Australia and in the eastern states, it seems reasonable to assume that at one time its distribution was extensive across Australia and perhaps still is! N.O.S.S.A. intends to confirm the presence of this very shy and well concealed orchid in South Australia.

REPORTED SIGHTINGS FROM SOUTH AUSTRALIA

Underground Orchids have actually been grown in South Australia by Dr Jack Warcup under laboratory conditions using seed obtained from Western Australia. Two of these plants were exhibited at the Adelaide Royal Show in 1984 as part of N.O.S.S.A.'s contribution to the Orchid Club of South Australia's (O.C.S.A.) display. After the show, a third-hand report reached the N.O.S.S.A. Committee that a farmer from the south-east of the state had reported, after seeing Dr Warcup's specimen, that he had once dug up an "identical" plant on his property. Unfortunately, no details were obtained at the time and N.O.S.S.A., being unsuccessful in trying to locate the farmer, was left with only an unconfirmed report.

In 1993, N.O.S.S.A. was told of a landholder in the Fleurieu Peninsula who quite possibly excavated a single specimen of the Underground Orchid while digging charcoal pits during the war years of the early 1940's. The landholder, who is now deceased, presented the specimen to his wife who was so taken by the beauty and uniqueness of the specimen that she took pen to paper and proceeded to describe it. The finder and his wife, both strongly interested in South Australia's native flora and fauna at the time, were convinced from the moment they saw the specimen that it was an orchid, but its underground habitat puzzled them at first. To quote:–

> ". . . my husband placed in my hand, one of these priceless, living jewels, reposing on a

> cushion of green velvet moss. Undoubtedly it was an orchid of some sort, about one inch across and borne on a two inch stem. Its wax-like petals were an opalescent white containing a mere breath of palest pink and it glowed like a pearl, so perfect and fragile, that I was over-awed by its beauty.
>
> "Where, O WHERE did you find it? I asked.
>
> "Up in the Big Timber . . . several inches under the ground.
>
> "Later, we wished we had made some inquiries about it but there were no telephones in the valley and there was a war on. The naming of an innocent, small flower that bloomed for itself in the darkness of the soil, seemed relatively unimportant . . ." **E.S.**

In October, 1982, the *Australian Women's Weekly* printed an article about *R. gardneri.* On reading the article, the authoress of the above description was certain the plant presented to her by her husband, was indeed the Underground Orchid.

The land on which the discovery was made remains much as it was 50 years ago, uncleared and undisturbed. N.O.S.S.A. Committee members have visited the site on three occasions but to date we have been unsuccessful in our search for this very elusive orchid. We are now intensifying our search.

In February, 1994, a devoted, amateur naturalist who resides in Port Elliott related another report, originally made by one of two brothers who recently owned a large property in the south-east:–

> "Following the start of the rainy season, the ground would develop cracks in some places of scrub. By inserting a pen knife into one of the cracks and gently levering the soil back, a white circular flower with petals around the edge would be revealed. It had a reddish centre and was not very common."

Two N.O.S.S.A. members from Lucindale, Les and Winsome McHugh, are now investigating the site and we believe there is an excellent chance they will be successful in locating the Underground Orchid within their search area.

WHEN AND WHERE DO WE LOOK?

With respect to our search for the Underground Orchid in South Australia, certain questions come to mind. Should it acutally be present in this state, would *Rhizanthella* flower in May/June as it does in Western Australia or would it flower in November/December as it does in the eastern states? The former seems more probable given that it appears to flower at the beginning of or during the rainy season. Is rain a stimulus to flowering? Does drought play a role? South Australia experienced a very dry summer/autumn this year. Will this mean we shouldn't expect any luck in finding *Rhizanthella* in 1994? Andrew Brown, Botanist W.A.T.S.C.U. (pers. comm.) comments: "From our observations it appears that *R. gardneri* flowers in greater profusion in the year following a good rainy season. In other words, if good rains are experienced in the autumn/winter/spring of 1993, *Rhizanthella* would more than likely flower in greater numbers in the autumn of 1994. Poor rains in summer and early autumn of 1994 would not appear to effect its flowering."

Should we be looking for *Rhizanthella* in *Melaleuca uncinata* scrub as this appears to be a required association in Western Australia or should we perhaps concentrate our search in areas of known *Dipodium punctatum* populations? Does South Australia have its own unique habitat for the orchid?

Soil samples have been collected from the two areas of our current search and these are being examined to determine whether or not the appropriate myccorrhizal fungus might be present. ✾

SOME OBSERVATIONS ON THE FLOWERING AND POLLINATION OF *PTEROSTYLIS PROCERA* M. CLEMENTS AND D. JONES IN NORTH-EAST QUEENSLAND

Tad Bartareau and Betsy R. Jackes
Department of Botany and Tropical Agriculture
James Cook University, Townsville, Qld. 4811

SUMMARY: The flowering and pollination of *Pterostylis procera* M. Clements and D. Jones plants were examined over three years *in situ,* all growing around Spring Creek, north-east Queensland. Although most produced new shoots each year, many did not flower each year. The flowers were pollinated by flies and mosquitoes. Plants were both self-fertile and outbreeding, but natural capsule production was low compared with experimentally hand-pollinated plants.

INTRODUCTION

Pterostylis R.Br., a major endemic terrestrial genus, is best developed in south-eastern Australia, although a few species occur in the south-west and some extend into the tropics (Dockrill 1992). *P. procera* M. Clements and D. Jones grows in open forests between the Endeavour and Pioneer Rivers, in north-east Queensland (L. Lawler, pers. comm.). Flowering and pollination has not been studied in this species of *Pterostylis.*

METHODS

The observations presented here were made between December, 1989 and January, 1993, on populations growing near Spring Creek, about 10km south-east of Herberton (17°23'S, 145°23'E, 900m). Flowering and pollination data were collected from 714 tagged plants within an area in which 31 random plots ($1m^2$) were located. Throughout the flowering period, flowers were examined in the field at regular intervals. Observations of pollinators were recorded whenever possible and classified according to the criteria of Adams and Lawson (1988). Pollinators were captured with an aspirator, pinned and samples sent away for identification. Since orchid pollen is removed in discrete bundles (pollinia) low capsule production may be the result of infrequent pollinator visits. Hence the number of flowers with pollinia removed and the number of mature capsules were recorded regularly. Hand, self- (n = 15) and cross-pollination (n = 13) experiments were made involving flowers on 28 plants, *in situ,* to determine the nature of the breeding system. Using fine forceps. Flowers were pollinated with fresh pollen between three to five days after anthesis. All manipulated flowers were labelled with coded plastic self-adhesive ring eyelets attached around the flowering stem. All experimental plants were covered with plastic mesh insect exclusion bags. Fertile capsules were designated as those that produced seed with embryos. Different plants were used each year.

RESULTS AND DISCUSSION

Flowering occurs from April to October and unpollinated flowers remain open for 15 to 20 days after anthesis. Insects collected visiting the open flowers were from the orders: *Coleoptera, Diptera, Hemipters, Lepidoptera* and *Thysanoptera,* but only two unknown fly species (Plate 1) and the mosquitoes *Aedes notoscriptus* Skuse (Plate 2) and *Anopheles annulipes* Walker were confirmed as pollinators of *Pterostylis procera.* Three unknown *Culex* species and *Aedes* (*Verallina*) sp. were observed and collected with pollinia attached to their scutum and are considered likely pollinators of this orchid. All insects were female.

In the flowers the dorsal sepals and petals, which are fused into the galea, have a sensitive labellum, so that when an insect enters the flower along the labellum it triggers an elaborate counter-balance system thus closing the entrance of the flower. The only exit from the flower is up along the labellum and against the column whose wings are curved to form a small tunnel. As the insect squeezes along this tunnel it is forced against the sticky rostellum, the pollinia becomes attached to its scutum and is carried off by the visitor as it escapes from the flower. This insect then visits another flower and again becomes trapped. However, this time the pollinia massulae from the first flower are deposited upon the sticky surface of the stigma, completing the pollination process. No obvious reward was collected by pollinators during this process and a relatively long time (0.5–4.5 hours) was taken between events observed during successful pollination sequences. As indicated by repeated experimental manipulations the irritable labellum of unpollinated flowers resets within 4–8 hours.

An average of 66.7% of flowers were visited and 20.7% produced capsules (Table 1). Thus, about three pollinator visits occurred per successful pollination. By comparison, the capsule set of 28 experimental pollinations was 100% and significantly greater than that of the controls. Results indicated that individuals are both self-fertile and outbreeding and that capsule production within a season was partly a result of pollination limitation.

Insect pollinating *Pterostylis procera* all came from the suborder Nematocera, a group of at least 12 families known to contain anthophilous taxa (Armstrong 1979). Observations of pollinators in this study were similar to those recorded for the other species of *Pterostylis* distributed throughout temperate areas of Australia (Beardsell and Bernhardt 1982). All insects bearing orchid pollinia were females, a phenomenum which has also been recorded in the Northern Territory. Here female mosquitoes (e.g., *Anopheles annulipes, A. farauti* (Laveran)) were found to carry pollinia of an unknown species attached to their heads (Piper *et al.* 1990).

Over three years *Pterostylis procera* had low conversion rates of flowers to capsules. If plants in this study are not entirely pollinator limited, then one may conclude that producing more flowers than capsules is an expression of their maleness (Janzen *et al.* 1980), presumably to increase the reproductive flexibility in a rewardless plant.

ACKNOWLEDGEMENTS

We wish to thank The Australian Orchid Foundation for support of this study, Richard Piper for identifying pollinator species and Peter Adams for comments on the manuscript.

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✾

Table 1: Frequency of Pollinia removal and capsule production of *Pterostylis procera* between 1990 and 1992.

Year	No. of plants with new shoots	No. of open flowers	No. of pollinia removed (%)	No. of mature capsules (%)
1990	714	47	29 (61.7)	9 (19.2)
1991	657	153	107 (69.9)	34 (22.2)
1992	565	22	12 (54.6)	3 (13.6)

A.N.O.S. CONSERVATION SUB-COMMITTEE — DATA BASE PROJECT INFORMATION SHEET 1 — ORCHID IDENTIFICATION

Graeme Bradburn

During May a Conservation Field Day was held at Wollongong to discuss the problems and issues that N.S.W. A.N.O.S. groups face in respect to conservation. It was agreed at this meeting that a number of steps would need to be initiated to assist societies and individuals to achieve their conservation objectives.

Firstly there needs to be a more co-ordinated approach to orchid conservation to ensure that important orchid sites are protected on a long term. To assist in this the Conservation Sub-Committee is initiating an N.S.W. NATIVE ORCHID DATA BANK to record the location of rare and endangered orchids (will include common orchids as well) and such information will be made available to the N.S.W. National Park & Wildlife Service (N.P.W.S.) to include in their Atlas of N.S.W. Wildlife.

Security of the system would require that only one person has access to the data and that a committee (drawn from the Conservation Sub-Committee) decides on who would have access to sensitive information.[1] To respect the wishes of the suppliers of information, they would be consulted in such a process if they wished. The information would be supplied to the National Botanic Gardens at Canberra and the N.S.W. N.P.W.S. In respect to the latter, this information would be included in the notification of rare flora and fauna that the N.S.W. N.P.W.S. supplies to councils. This is to notify the existence of rare and endangered flora and fauna within four kilometre radius which would need to be followed up in respect to any development proposal.

For this project to succeed, correct identification is required. Therefore as part of this project an IDENTIFICATION SYSTEM is also being created. This will be open to any native orchid species (not hybrids or flasked clones). It is hoped that even apparently easily identified species would be included, since many closely related species (many of which are still to be described and named) are difficult to correctly label. The identification would be carried out by Ron Tunstall and John Riley (Canberra Botanic Gardens Associate Staff Members specialising in native orchids) liasing with Canberra staff members. People sending flowers will receive a reply giving them the name of the species, or its nearest affinity (named species).

The conservation project therefore aims to:–

IDENTIFY ORCHID SPECIES

↓

PROVIDE INFORMATION TO SENDER

↓

DATA BANK

↓

N.P.W.S. & CANBERRA NATIONAL BOTANIC GARDENS

↓

ACTION TO PRESERVE ORCHIDS

---

[1] Data bank information would only be made available for serious scientific study or for an obvious conservation benefit.

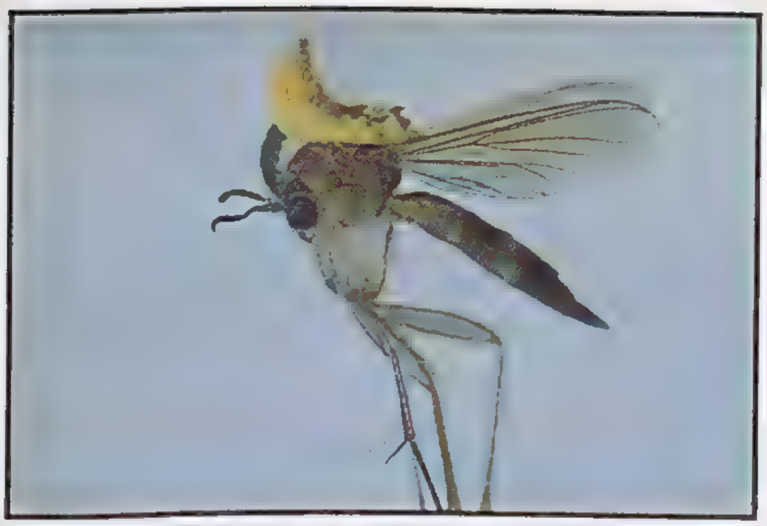


Plate 1: Fly sp. with *Pterostylis procera* pollinia. Photo: T. Bartareau.

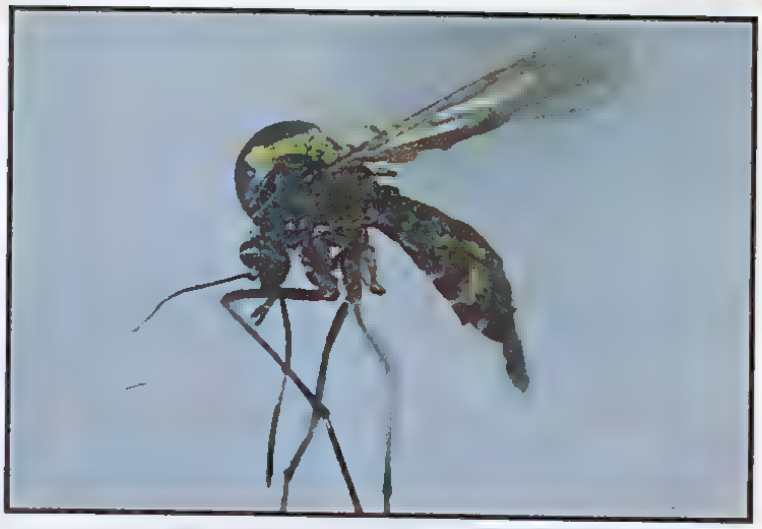


Plate 2: *Aedes notoscriptus* with *Pt. procera* pollinia. Photo: T. Bartareau.

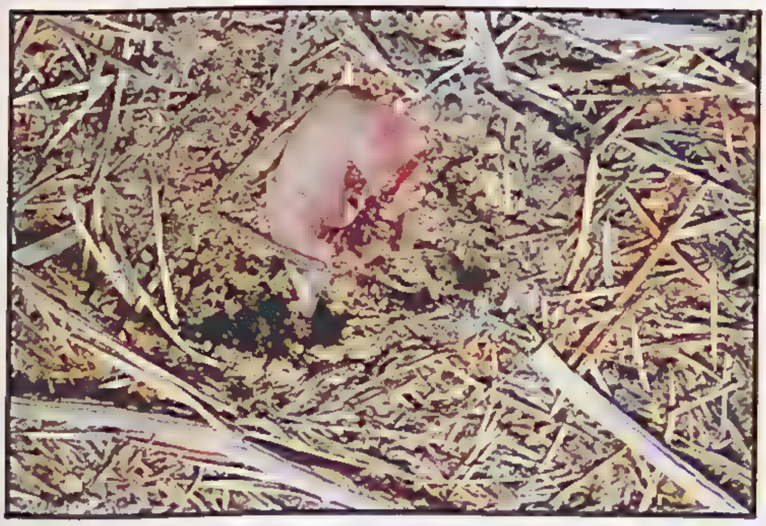


Plate 3: *Rhizanthella gardneri.* Photo: A. Brown.

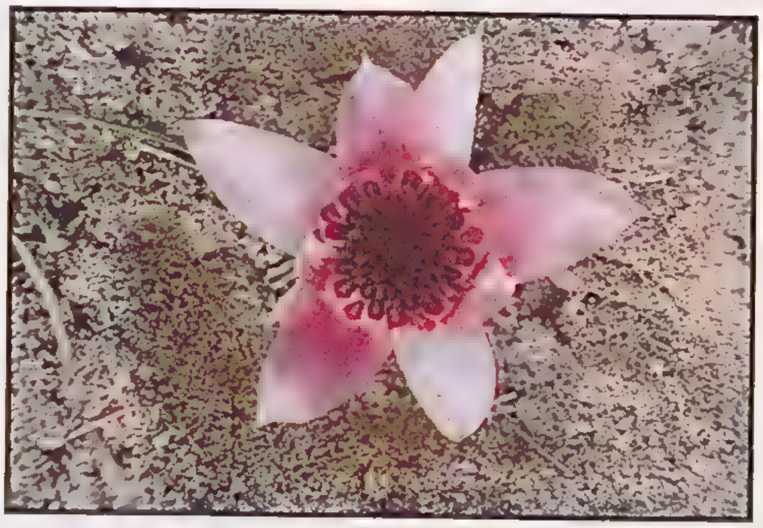


Plate 4: *R. gardneri.* Photo: A. Brown.

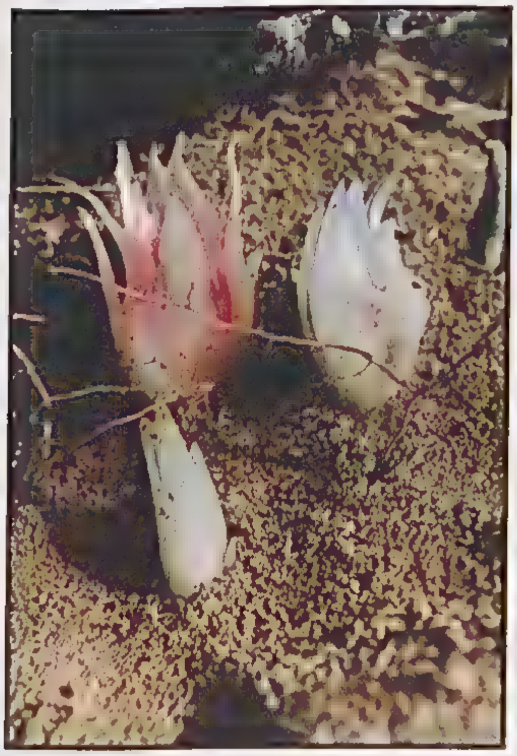


Plate 5: *R. gardneri.* Photo: A. Brown.

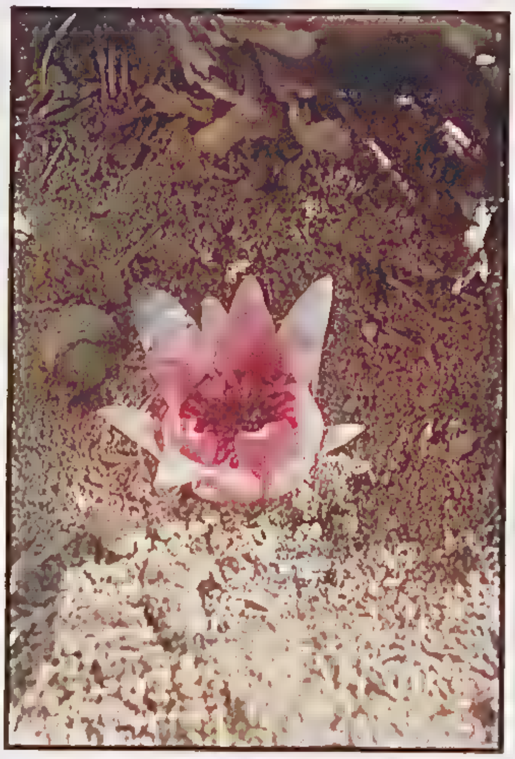


Plate 6: *R. gardneri.* Photo: A. Brown.

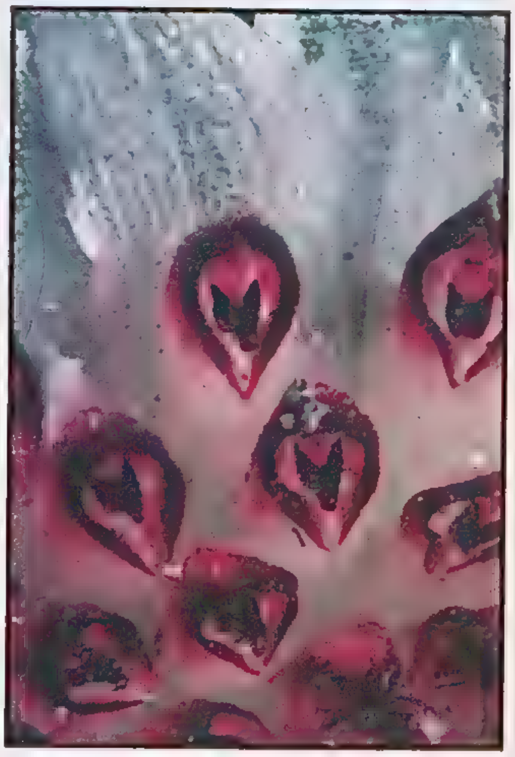


Plate 7: *R. gardneri.* Photo: K. Dixon.

To commence this project the identification of N.S.W. native orchids is now operational. The following are some guidelines to assist in sending flowers for indentification.

SEND

- Specimens cultivated or collected from the wild.
- The more of the flowering part of the plant, the better.
- Wrap in just moist tissues (not wet), place inside a snap seal plastic bag.
- Don't assume that because the plant is common in your area that it must be a named species.
- Always account for different "forms" of the species that occur in your area especially if they flower at a different time, exist in different habitats or have a different host tree.

INCLUDE

- Name of sender.
- Address.
- Telephone number.
- Specimem 1 locality; Specimem 2 locality, etc.
- Include clonal variation if possible.

DO NOT SEND

Orchid species from National Parks or flora reserves. If you are interested in an orchid from these areas you can contact us and we can possibly organise an authorised collection.

ADDITIONAL

If you live in southern Queensland or northern Victoria you are welcome to participate.

LOCATION INFORMATION

If you can provide details of its location (if applicable) and other details, please do so.

- Location: give a grid reference from a C.M.A. topographic map or photocopy the relevant section.
- Provide information about the number of specimens seen.
- Mention who controls the land, e.g. Crown, private, etc.
- Any threat to the orchid.

More detailed guide for information for the Data Base will be given at a later date.

SEND TO

To assist Ron Tunstall and John Riley please follow the following general guide where possible:–

RON TUNSTALL	JOHN RILEY
Bulbophyllum – ideally flower(s) and pseudobulb	***Acianthus*** – whole spike and leaf
Calanthe – complete flowering head and section of stem	***Caladenia*** – flower and stem
Calochilus – whole spike	***Caleana minor*** – flower and stem
Corybas – flower and leaf	***Chiloglottis*** – flower and leaves
Cymbidium canaliculatum – whole spike	***Dendrobium speciosum*** alliance – flower spike
Genoplesium – snip off just above ground level	***Dendrobium aemulum*** – flowers and pseudobulb
Lyperanthus suaveolens – whole spike	***Dendrobium*** species (other) – flowers only
Microtis – snip off just above ground level	***Dipodium*** – whole spike
Oberonia – whole spike	***Diuris*** – whole spike
Phaius – flower(s) plus part of stem	***Eriochilus*** – flower, stem and developing leaf
Prasophyllum – snip off just above ground level	***Erythrorchis*** (***Galeola***) ***cassythoides*** – section of the flowering plant
Pterostylis – whole spike	***Gastrodia*** – flower and stems
Sarcochilus – whole spike ***Sarsochilus hillii, S. olivaceus, S. falcatus, S. ceciliae*** in particular	***Liparis*** – flowering spike
Spiranthes – section above ground level	***Orthocerus*** – whole spike
	Plectorrhiza – whole spike
	Thelymitra – whole spike
Send to – Ron Tunstall PO 32 Keiraville 2500 Phone: (042) 27-1301	Send to – John Riley 25 Woronora Avenue Leumeah 2560 Phone: (046) 25-5457 ✾

FIRST CHARITY FESTIVAL OF AUSTRALIAN NATIVE ORCHIDS IN QUEENSLAND – OPEN DAY & SHOW SUN., 2nd OCTOBER – THE COMMUNITY HALL, DAYBORO

Open to the public: 10 a.m. to 4 p.m.

Admission: $1.50.
Benching from: 7 a.m.

Presentation of Prizes: 4 p.m.
Judging: 9 a.m. to 10 a.m.

SALES AREA will have Australian native orchids (species and hybrids). The very latest in seedlings or flasks. Plants from S.G.A.P., pottery, books, potting demonstrations. Information and cultural advice freely given. All under cover. Parking no problem. Buses welcome.

FOOD to please all tastes, readily available at reasonable prices. An all day barbecue at the Sausageman's Park. A café, a restaurant or counter meals at the local hotel, are all close by. The choice is yours.

DAYBORO is a little community about 45 minutes from the centre of Brisbane with dairying and pineapple farming in the beautiful Samford Valley. There is great historical interest in the area and the old Butter Factory still stands.

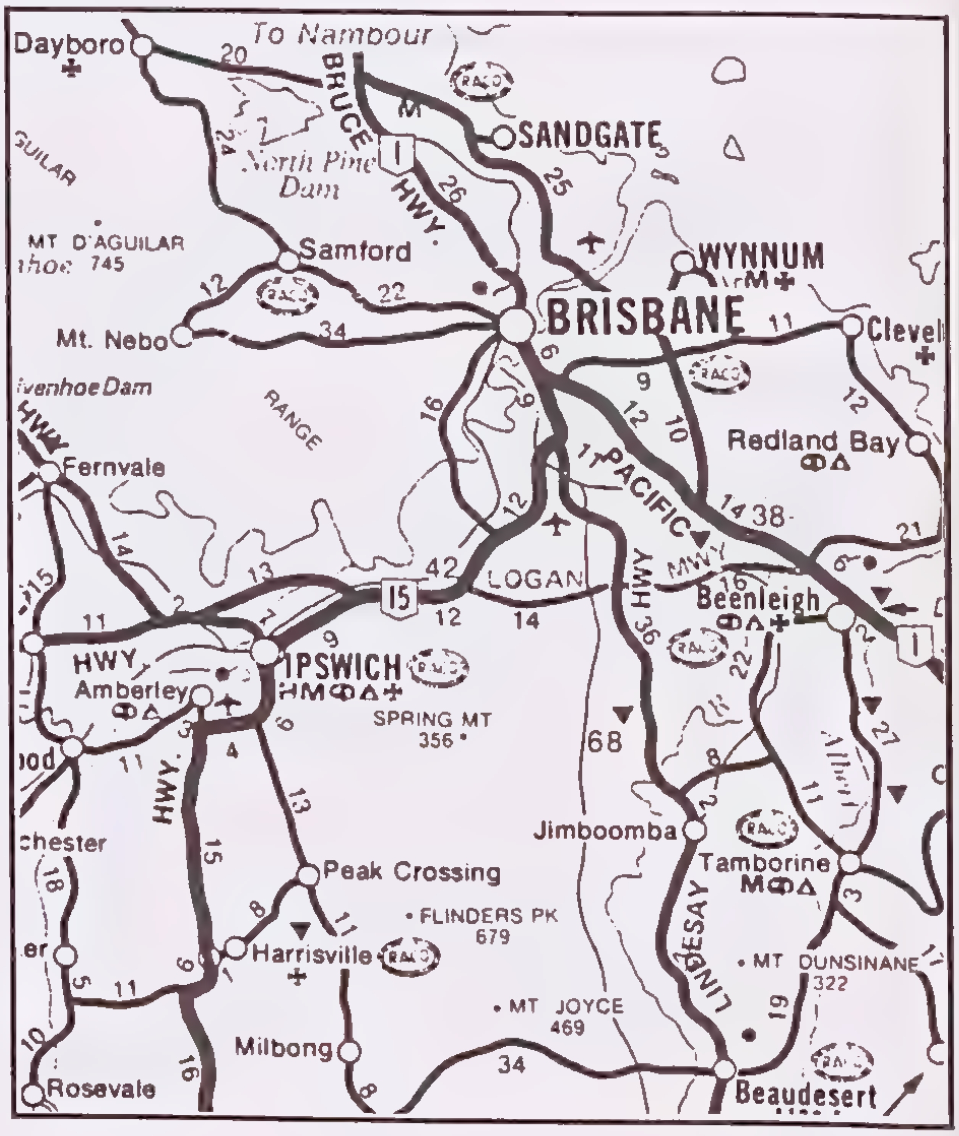
Settlement first came in the early 1870's. One early explorer wrote from his high perch on Mt Cootha: "to the north the eye extends over a tract of lofty forest covered hills interspersed with extensive areas of *Araucaria* (Moreton Bay Pine) of which sombre green forms a striking contrast to the brownish hue of *Eucalypt* trees. The view easterly is most commanding with Moreton Island and Bay, Stradbroke Island and the Glass House Mountains."

DAYBORO can be reached through Petrie north of Brisbane or through Samford on Brisbane's west side (see map below).

Mt Mee, 24km north of Dayboro, has a new rainforest walk just south of the township where, with very little effort one can see the natural beauty of epiphytes, orchids and staghorns and hear many beautiful bird songs. More beauty can be enjoyed at Brisbane's Mt Glorious, Mt Nebo and Brisbane Forest Park, all within a 30 minute radius of Dayboro.

FURTHER INFORMATION

Phone Bev or Frank on (074) 98-2185 or write SIMPSONS ORCHIDS,
29 Gannon Street, Mt Mee, Qld. 4521. ✽



DUNGOG 1994

Michael Harrison
68 Howes Road, North Wilberforce, N.S.W. 2756

Ken Russell's 5th Annual Show at Dungog on Sunday, 15th May, 1994, was another great success and his decision to move the show to the Dungog High School auditorium certainly provided ample space for exhibitors and vendors alike.

The weather was lovely, if a little chilly in the early morning, the orchids were superb and the people were as friendly as ever. This day in Dungog each year has developed a reputation as a real social event, a meeting of the clans if you like and the clans certainly turned out en masse this year.

From as far afield as Melbourne in the south and northwards to Brisbane, they came to celebrate a love of native orchids, at a time when, not too many seasons ago, it would have been unthinkable to have put together a native show. Such have been the advances in breeding, that we now accept autumn shows as a normal part of the native orchid calendar and as further advances and breakthroughs are made, we will see more and more natives in flower right through the cooler months from March until October. We live in exciting times!

Henry Wilson of Singleton took out Grand Champion this year with *Dendrobium* Hilda Poxon 'Sid' — no prizes for guessing this was one of the red-lipped forms bred by Sid Batchelor. It was a beautifully grown and flowered plant, the primary inflorescence carrying 26 widely opening flowers and eight buds. In keeping with this form, the flowers were a lovely clear yellow/green, with evenly spaced, rusty-red blotching on the face of the flower. And the lip, of course, featured that striking suffused pink patterning, so characteristic of this line of breeding. Unfortunately, Henry was away on business that week, but he had left the plant for safe keeping in the hands of Henk van den Berg. Henk told me he was unsure that the flowers would open up properly in time, but whatever he did, he got them just right on the day. Congratulations Henry, it was a worthy champion.

Any native show held during April/May should feature lots of *D. bigibbum* and at Ken's shows this species has a place of prominence, with a section devoted to just the *D. bigibbum* complex. Appropriately, Reserve Champion for 1994 was granted to a superb specimen benched by Gordon Young, who transported down to Dungog a goodly number of fine native orchids from his home in Ballina, a distance in excess of 600kms. His *D. bigibbum* 'Raffles', originally a seedling out of Ken Russell's 411 cross (*D. bigibbum* 'Dark' X 'Beauty') was a 40cm tall plant carrying a number of arching inflorescences, each with upward of a dozen shapely, mauve flowers. Gordon grows his plants to perfection and he has that special knack of getting them beautifully into show condition without a blemish. It was a real picture.

I commend to all native orchid enthusiasts the Ken Russell Show in Dungog, each year in May. It has become a real institution and I wouldn't miss it for the world. ✾

THE VERSATILITY OF POTASSIUM PERMANGANATE

Ian Carter
47 Austin Avenue, North Curl Curl, N.S.W. 2099

Potassium Permanganate, commonly called Condy's Crystals, has many uses. Although it has been superseded by antibiotics and other modern medicines, in years gone by it was an all-round remedy for many ailments. for example, it was the recommended treatment by the army for tired or sore feet, especially as a prevention against Tinea; snake bite kits contained a lance, a tourniquet and Condy's Crystals; for sore throats, a gargle with Condy's (about 1 part per 4000 — a light pink solution) was the standard treatment — as a matter of fact, I still use this and many people suffering from rheumatic conditions used to drink small quantities of a very weak solution — it is very poisonous if ingested in large quantities.

Although many of these were "Old Grannies' Remedies", Condy's Crystals is still used as an astringent, a bactericide and a deodorant. It is used for the relief of ulcers and abrasions, as a gargle and mouthwash, as a wet compress, for the treatment of dermatitis and for relief from Poison Ivy. In some cases, it is used for the treatment of morphine, opium and strychnine poisoning.

So, what has this to do with orchids? I have been using Condy's for many years and have found it to be a good all-round remedy for most of my orchids' ailments. When I deflask my seedlings, I rinse the young plants in a weak solution — about 3 grains to a gallon of water. This, I find, prevents fungal attack. All my losses come later, from many other causes which I won't mention now.

A stronger mixture can be used for sterilising used pots. Having scrubbed the pot in soap and water, fill a container with Condy's and soak the pots for half an hour.

If you have a new plant that looks a bit distressed, soak it in Condy's before putting it in your orchid house. This is also a good rule for plants that have been found lying on the ground in the bush. Also, when you spray with a fertiliser or insecticide, a few grains of Condy's doesn't do any harm. It not only helps to fight diseases, but the plant uses the small amount of potassium to make better flowers. Another advantage is that Condy's is relatively cheap and a little goes a long way.

There is only one drawback to this — and that is Condy's Crystals' discolouration is difficult to remove from your hands. However, you can always wear gloves.

These are only observations I have made over a number of years from continual use of this chemical. I have not carried out any specific or controlled experiments, yet I find Condy's has worked well for me. So, if you wish to try it, I hope you have the same success as I have. ✾

SHOW DATES

QUEENSLAND

Kabi	15/17 Sept.	Chermside Shopping Centre
N.O.S. of Toowoomba	17/24 Sept.	Harristown State High School, Toowoomba

NEW SOUTH WALES

Central Coast	8/11 Sept.	Mt Penang Centre, Pacific Highway, Kariong
Macarthur & Dist.	15/17 Sept.	Casula Mall
Mid-North Coast	21/22 October	Sarc Show – Manning Hall, Taree
Newcastle	20/22 October	Sarc. Show – Lake Macquarie Fair, Mt Hutton
Port Hacking	11 Sept.	Scout Hall, Oliver Street, Heathcote
	30 October	Sarc. Show – Scout Hall, Heathcote
Sydney	17/18 Sept.	Baulkham Hills Community Centre
	23 October	Sarc. Show – Baulkham Hills Community Centre
Warringah	10/11 Sept.	Community Hall, Starkey Street, Forestville
	23 October	Sarc. Show – Community Hall, Starkey Street, Forestville
Wollongong & Dist.	16/17/18 Sept.	Wollongong Botanical Gardens

VICTORIA

Geelong	5/6 November	Geelong
Victoria	1/2 October	Holmesglen College of TAFE, Glen Waverley

SOUTH AUSTRALIA

N.O.S.S.A.
17/18 September
Mitcham Girls High School,
Seafield Avenue, Kingswood

WESTERN AUSTRALIA

A.N.O.S. of W.A.
29 September/1 October
Grove Shopping Centre,
Cottesloe

Native Orchid Conference

Call for papers

The first New Zealand Native Orchid Group Conference
will be held with the annual Taupo Orchid Society Field Days
on 2-4 December 1994
to celebrate the official opening of the
Iwitahi Native Orchid Reserve and Heritage Park
by the Hon Simon Upton, Minister for the Environment.
Offers of papers and registration enquiries should be directed to
Trevor Nicholls, 33 Hinekura Ave, TAUPO. Phone: (07) 3784813

MORE ON BIOLOGICAL FUNGICIDES

Alan Merriman, Miriam Ann Orchids
89 Levy Street, Glenbrook, N.S.W. 2773
Phone: (047) 39-5141

It was good to see my old friend Ted Gregory writing about these new biological fungicides. The one that Ted writes about has been available here in Sydney for around four years. It was developed by J. H. BIOTECH of California, U.S.A. some years ago. One thing to remember it is not a fungicide and does not claim to be so.

It can antagonise a broad range of soil born fungi such as *Rhizoctonia, Pythium, Phytophthora, Fusarium, Sclerotium, Armellaria, Botrytis,* etc.

These fungi live symbiotically with the plants root systems, thereby creating a protective buffer around the root zone. It takes from five to ten days to take effect. It is a protectorant rather than a curative fungi. It has a long term residual effect on the plant. In fact it lasts a minimum of six months after application. It has been said that it is a growth stimulant, promotes early flowering, more flower formation, shoot and root growth.

The active ingredient is trichoderma and has a minimum count of 500,000,000 active spores per one gram of product. For orchids the rate is 100 grams dissolved in ten litres of water. Use as a heavy drench. It can also be used in the potting mix. In compost, 16 grams in one metre of mix.

DO NOT APPLY OTHER FUNGICIDES WITHIN TEN DAYS OF APPLYING THE DRENCH. The less you use other fungicides the better.

It is available in Sydney under the trade name of ROT GARD and TRICHODERMA.

If you require further information on this product please contact me. ✻

CALADENIA CARNEA 'SUZANNE' ACC/ANOS (Plate 36)

Darryl Smedley, Acting Registrar
NSW ANOS Judging Panel

This beautifully cultivated terrestrial was granted an Award of Cultural Commendation (Award No. 22) at the A.N.O.S. Sydney Group Inc. Spring Show at Baulkham Hills, N.S.W. on 10th September, 1993. The vote of the Judging Panel was eight for and none against with an average of 77.25 points. The grower was Mr Bill Kennewell of Greenacre, N.S.W.

The exhibit was described on the award documentation as:–
"Thirteen flowers from eleven tuberoids in a 150mm pot. Typical form, pale pink and slightly above average for size with the largest flower 32mm across petals. All leaves in good condition. No blemishes on the flowers. Flowers basically facing the same direction on the same plane (more-or-less) about 180mm above the level of the media. Two double-flowered inflorescences to 200mm above the media. Grower advised in cultivation for about seven years. An attractive well-cultivated exhibit of a single clone. Measurements: 32mm across petals; 29mm depth; labellum 6mm wide." ✻

CALADENIA CARNEA 'SUZANNE' ACC/ANOS

Bill Kennewell

This clone comes from the central north coast of N.S.W. and consisted of two plants originally.

I have had these plants for nine or ten years.

The original plants were potted into a basic terrestrial mix with some of the soil from the area added.

Over the years the plants slowly multiplied and in 1988 were awarded Champion Native Species at Bankstown Orchid Society Show with eight flowers.

In 1992 the plants were repotted for the first time with 11 large tuberoids into the original pot and six small to a spare pot.

The 11 tuberoids flowered in 1993 and were awarded a Cultural Certificate at A.N.O.S. Sydney Group Spring Show together with Champion Species.

The pot is kept under fibreglass at all times. Kept very dry in the dormant period and first watered toward the end of March by standing the pot in a container of water so that the mix is evenly damp.

Three or four times during the growing period a weak solution of Johnson's mix is added. ✻

A TASMANIAN EXPERIENCE

Jim Smith
11 Warren Court
Howrah, Tasmania 7018

The impression that many mainlanders have of Tasmania as a place where its always cold and wet with little sunshine is totally incorrect. Although, it is possible to experience all four seasons in one day.

Hobart has an annual rainfall of 600mm, which is spread evenly throughout the year. Daytime temperatures range from 7°C in winter to the high 30's in summer. Night time temperatures in winter can fall to zero.

Despite some challenges created by mother nature orchid growing is alive and well in Tasmania, with interest in Australian native dendrobiums continuing to grow each year. Spring shows see an increasing number of new hybrids flowering for the first time and ever larger specimens adding to displays. The public and newer orchid growers are being slowly educated to admire and appreciate our native orchids, rather than think only of exotics.

My own interest in Australian natives commenced in the early to mid 70's with the purchase of small plants of *Dendrobium beckleri, D. Xdelicatum, D. falcorostrum, D. linguiforme, D. pugioniforme* and *D. teretifolium.* All plants are still alive and well, although the degree of growing success has varied.

In 1979 I purchased the first of hundreds of seedlings from Double U Orchids and when *D.* Harold Hirsch (Plate 14) flowered in 1983 I was hooked. The flowers were 75mm long and a clear golden yellow. From that initial purchase I also flowered *D.* Hilda Poxon 'Gold Star' HCC/TASM/AOC (Plate 13), *D.* Star of Gold 'Howrah' AD/TASM/AOC (Plate 8) and *D.* Ku-Ring-Gai (Plate 9).

Each year I look forward to the first flowering of seedlings to see whether there is a potential champion amongst them. The majority of plants I have were bought as unflowered seedlings or in flasks. Although you may have to wait a little longer for flowers and suffer some plant losses in the meantime there is a sense of achievement when the flowers appear. *D.* Ring of Fire (Plate 10) although slow to flower was worth the wait for the colour. When used in breeding it produces huge pods but never any seed.

My most successful plant has been *D.* Bardo Rose 'Bronilyn' HCC/TASM/AOC (Plate 11) which has won the Ira Butler Award on four occasions. Attempts to breed with this plant have been unsuccessful to date as it appears to be sterile.

The majority of my growing has been under less than ideal conditions. When we moved into our current home in 1976 the house was unfinished and orchids had to take a back seat. A temporary structure of timber and chicken wire covered with clear plastic was erected and became semi-permanent with the plastic being replaced every couple of years as it started to break down, until a proper growing area was built in 1992.

The new area is on an easterly slope, running north/south and is 7m x 5m with a minimum roof height of 2.4m.

Features of the orchid house are (Plate 12):–

- construction of treated pine with clear continuous fibreglass walls.
- 60% of the roof is covered with clear fibreglass, again without joins.
- 50% green shadecloth covers all the roof and eastern side down to bench top level.
- benches are treated pine and galvinised ARC mesh and are positioned to allow me easy access to plants and also provide maximum light to plants.

- having part of the roof open to the air provides good air movement, particularly on warm days.

The most important aspect of successful orchid growing is understanding the conditions under which the orchid naturally grows and endeavouring to provide a similar environment. Hopefully I have gone someway toward this in the new growing area.

Plants are now into their second year in the new environment and I am starting to see the benefits. An increase in the number and size of canes per plants and many seedlings flowering for the first time. The increased growth has meant repotting and therefore a need for additional space, as what I had is fast disappearing. Orchid collections have this knack of expanding to fill all available space and more.

It is very important in southern Tasmania that the growing media used retains some moisture without being wet as a sudden cold change can damage those important roots. Over the years I have experimented with many different mixes with various degrees of success. Currently I am using 60% Debco bark, 15% quartz gravel, 15% connundra shell and 10% myrtle leaf litter. This provides an open mix and drains easily.

During the main growing period, September to April I water daily and on the occasions that the summer temperatures reach 30°C plus I mist the plants and water paths and under benches to provide a more suitable atmosphere.

In autumn/winter when daytime temperatures can vary from 17°C down to less than 10°C and night temperatures fall to 0°C extra care is required. Watering is done on an "as required basis" in the a.m. to give plants plenty of time to drain. Mounted plants are dunked in a plastic bath to allow the wood or fern to absorb some moisture.

The intention is always to fertilise on a regular basis throughout the growing period but somehow it never quite eventuates.

I use a variety of fertilisers and alternate between aquasol, nitrosol, maxicrop and seasol at half strength. Dynamic Lifter has been used to some extent with good results and this year I think I will use it even more.

The fishing and woodchip industries in Tasmania had a waste disposal problem and a few years ago they got together in an endeavour to solve the problem to their mutual benefit. The result was OR90 or Fish and Chips. *Eucalyptus* bark and fish waste are combined in huge heaps and allowed to rot down over two years. The final product is a grey/black odourless powder which encourages plant growth.

I have been using OR90 sprinkled around the top of pots and watered in after repotting with excellent results. Used on deflasked seedlings I find they establish quickly and develop new growths within a very short time. Hopefully this will result in earlier flowering of seedlings.

To ensure aphids do not cause damage to flowers and new growths I use a systemic spray every six months. The only insect that has caused me a problem is scale getting on the canes, of specimen plants, just below the leaf nodes. White oil appears to have some success, but I would appreciate the advise of any reader on how to combat this problem.

For me orchid growing is a very satisfying hobby and meeting and learning from other growers is part of the enjoyment. ✾

A TASMANIAN EXPERIENCE

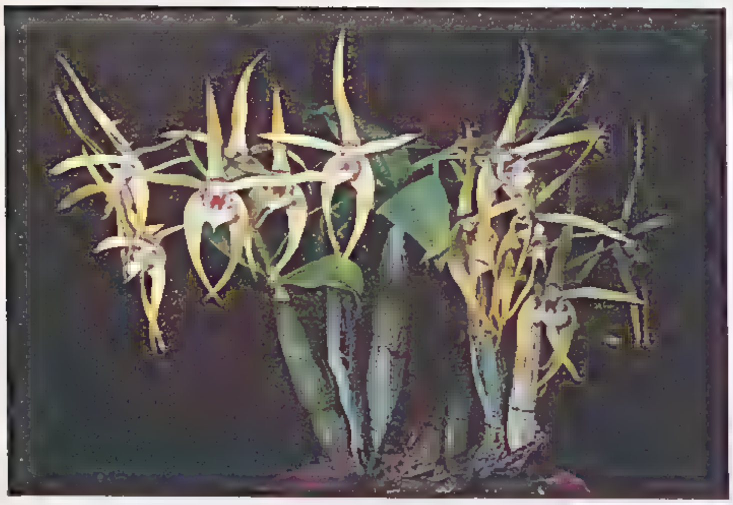


Plate 8: *Dendrobium* Star of Gold 'Howrah' AD/TASM/AOC.

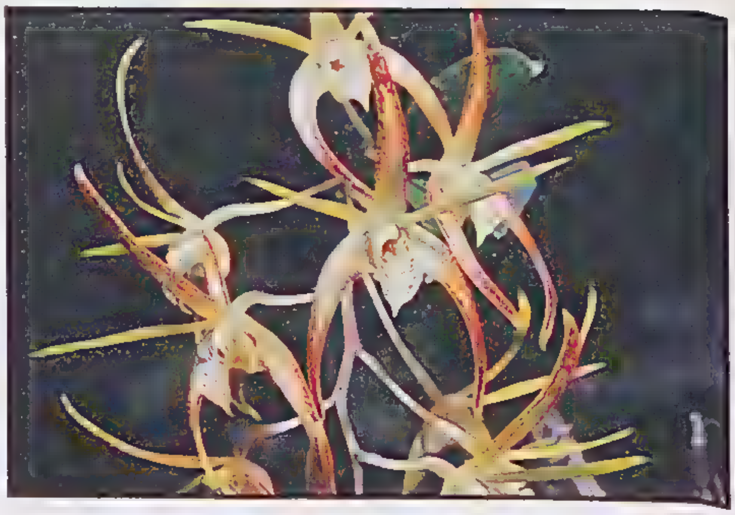


Plate 9: *Dendrobium* Ku-Ring-Gai.

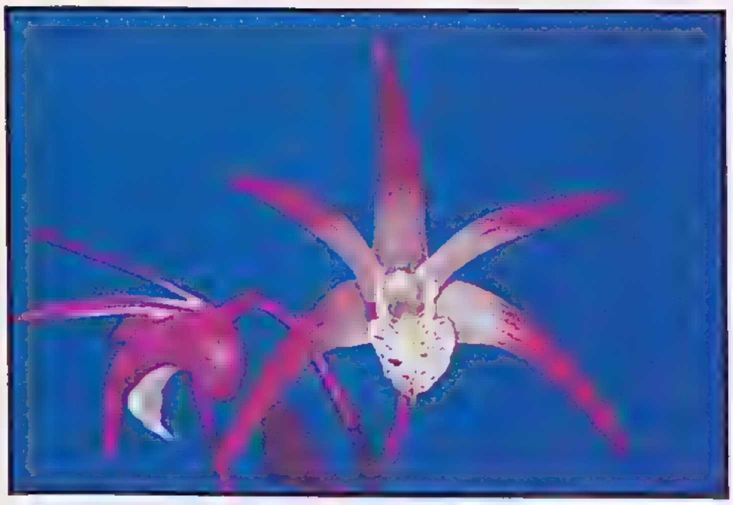


Plate 10: *Dendrobium* Ring of Fire.

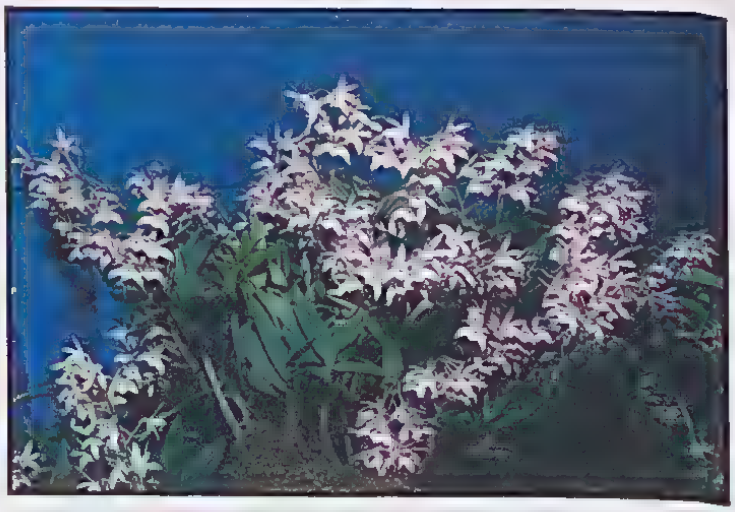


Plate 11: *Dendrobium* Bardo Rose 'Bronilyn' HCC/TASM/AOC.

Plate 12: Orchid house.

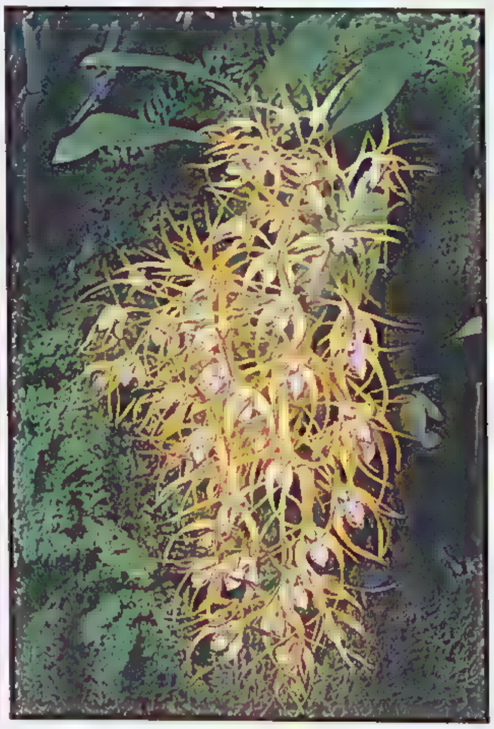


Plate 13: *Dendrobium* Hilda Poxon 'Gold Star' AD/TASM/AOC.

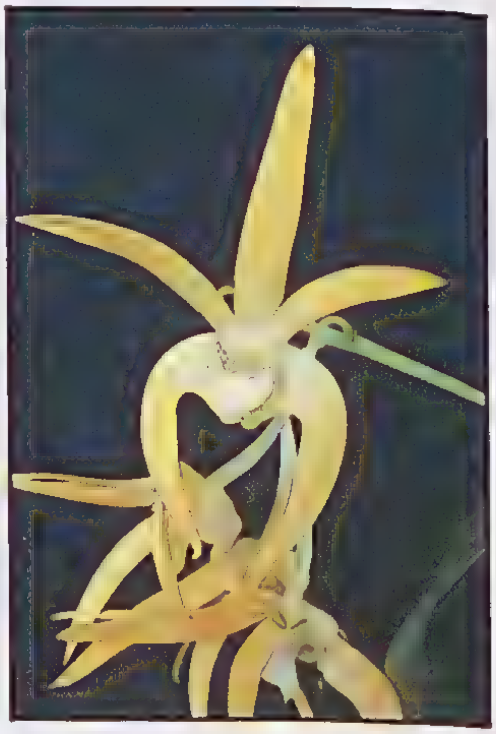


Plate 14: *Dendrobium* Harold Hirsch.

Photos by J. Smith

AUSTRALASIAN ORCHIDS ILLUSTRATED

No. 14: *Dendrobium schneiderae* Bailey

Common Name:	No common name
Subfamily:	Epidendroideae
Tribe:	Epidendreae
Subtribe:	Dendrobiinae
Genus:	*Dendrobium* Swartz

Distribution: *Dendrobium* is a widespread genus, with species found from India and Sri Lanka south to Australia and New Zealand. *Dendrobium schneiderae* is found in north-east N.S.W., south-east and central eastern Queensland.

Notes: The genus *Dendrobium* is one of the largest genera in the Orchidaceae and is estimated to contain between 900 and 1,400 species. *Demdrobium schneiderae* is a relatively small dendrobium, which grows as an epiphyte or a lithophyte. The pseudobulbs are crowded together and grow into small clumps. Each pseudobulb has one to three apical leaves. The inflorescence is a raceme, which is arched and pendulous, with up to 25 flowers. The flowers are cupped and are greenish yellow in colour and occasionally have red markings on the edges of the petals and sepals. The flowers are often fragrant and long-lasting, with the plant remaining in flower for months. The cupping of the flower, is a result of the curling of the lateral lobes of the labellum toward the column and the close proximity of the labellum to the column. This cupping of the labellum with the column forms a floral tube for the pollinator to enter, which will direct it past the stigma and the anther. There are two recognised varieties of *D. schneiderae. D. schneiderae* var. *major* can be distinguished from the type variety as the pseudobulbs are more robust and the inflorescence has more flowers which have longer petals and sepals.

Pollination: There is no recorded pollinator for this species.

Conservation Status: This species is listed as "3RC–" by Briggs and Leigh (1988) and is considered to be rare. Although restricted, this species is not in immediate danger of extinction as plants can be found within reserves over a wide geographic range.

Culture: *D. schneiderae* is well suited to cultivation on mounts. These plants will take time to become established, but once established they will then spread and produce a good floral display of small flowered arching racemes. They can be grown cold with ample light and frequent watering over the warmer months.

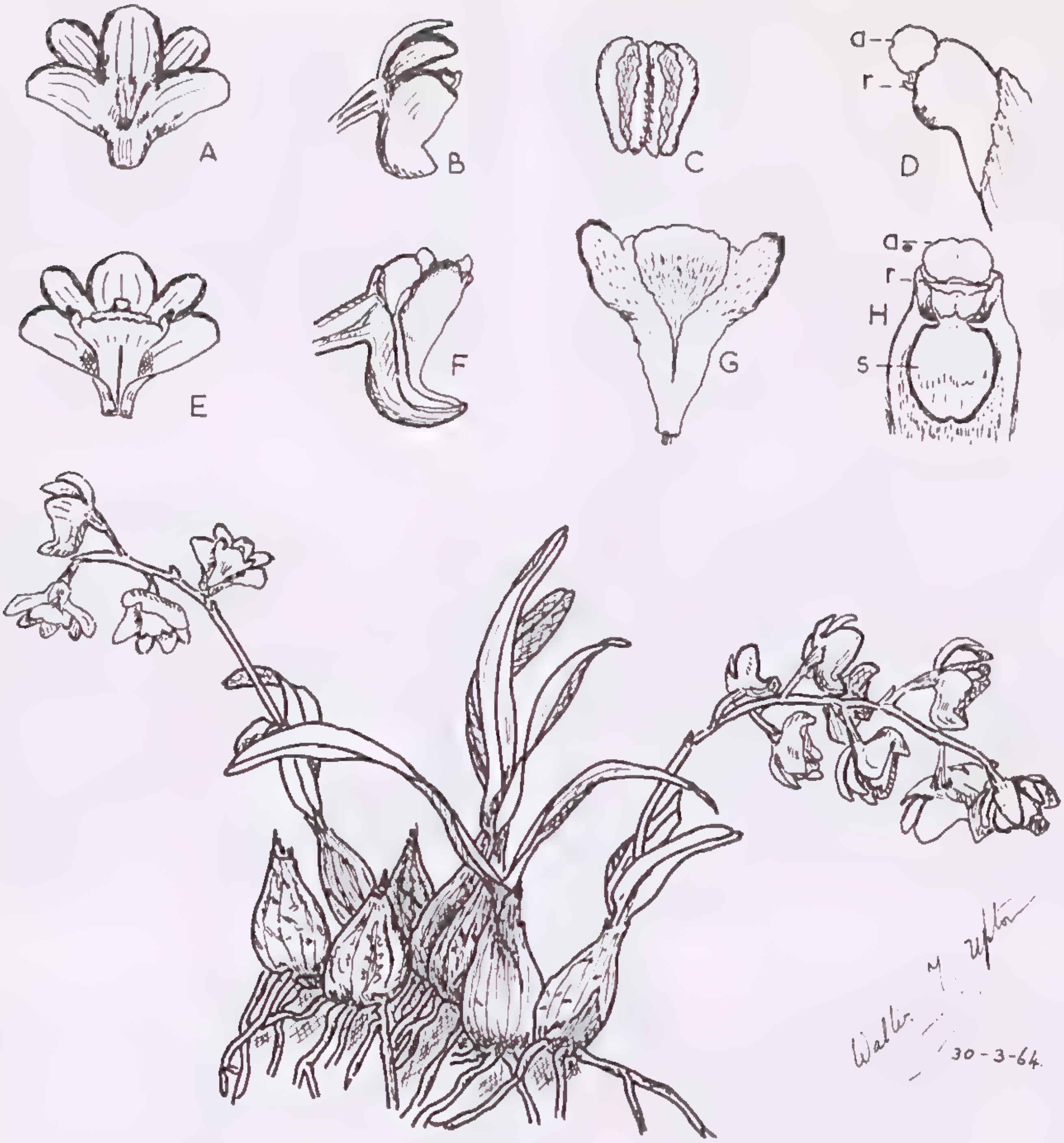
Illustration: Painting: Illustrated is a small clump of *D. schneiderae* pseudobulbs with three inflorescences which show their arching habit. At the base of the painting are two flowers, the one on the right has the labellum removed showing the stigma and the anther.

Description: By Tony Slater, 159a Raleigh Street, Thornbury, Victoria 3071.

Illustration: By Helene Wild, 56 Civic Parade, Seaholme, Victoria 3018.

Line Drawings and Captions: By Walter T. Upton, P.O. Box 215, West Gosford, New South Wales 2250.

Reference: Briggs, J. D. and Leigh, J. H. (1988). Rare or threatened Australian plants. Special publication No. 14. Australian National Parks and Wildlife Service, Canberra.



Dendrobium schneiderae Bailey

Collected in the McPherson Range, south-eastern Queensland in 1960.

(A) Flower, rear view 3X; (B) Flower, side view 3X; (C) Pollinia 12X; (D) Column, side view 6X; (E) Flower, front view 3X; (F) Column and labellum, side view 4X; (G) Labellum, pressed flat 6X; (H) Column, front view 8X; (I) Plant, approx. 1X.

a = anther; r = rostellum; s = stigma.

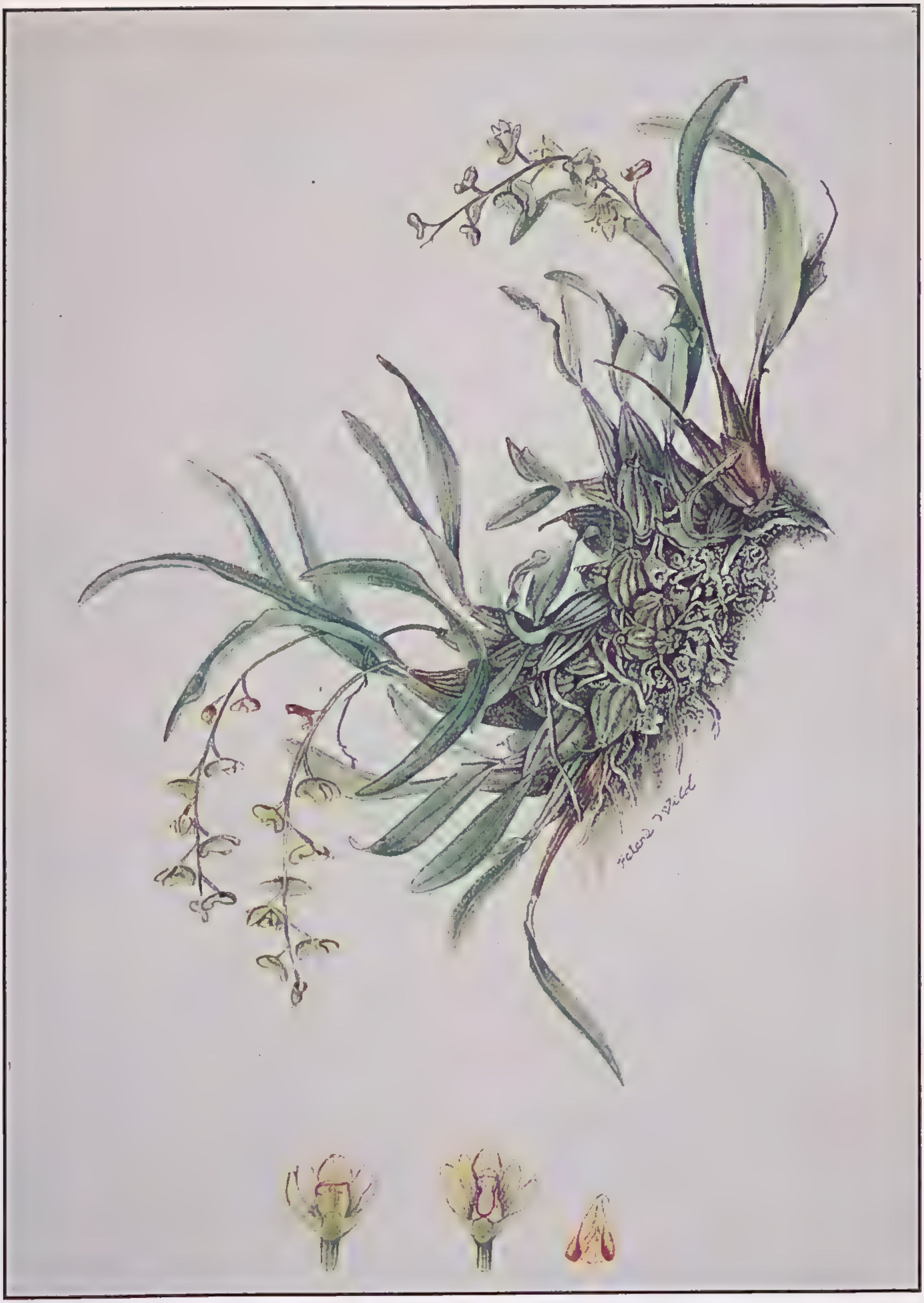


Plate 15: *Dendrobium schneiderae* Bailey. From a painting by Helene Wild.

Ed.—This is a paper submitted by one of the successful student judges participating in the A.N.O.S. Judging School held in Brisbane recently. All student judges are required to present a paper as part of the written examination.

DISTRIBUTION, GENERA, SOIL TYPES, HABITAT AND POLLINATION OF SAPROPHYTIC ORCHIDS IN AUSTRALIA

Lex Barton
C/- P.O. Box 79, Ipswich, Qld. 4305

The term saprophyte is used for any plant that does not manufacture its own food by photosynthesis but uses organic material (previously manufactured by other plants) in its substrate.

During the seedling development phase, orchids go through a saprophytic stage which can, in some species, be extended in varying degrees. It should not, therefore, come as a surprise that wholly saprophytic species do occur. Where this situation arises the plant, in the main, remains out of sight except at flowering time.

Saprophytes characteristically have an absence of roots or at best they are poorly developed. The presence of a coral like root structure has been observed in some species.

Leaves are typically much reduced and in many species are no more than bracts. Saprophytic plants lack chlorophyll therefore the green colour normally associated with plants is not evident. Photosynthesis is possibly a more efficient source of energy and this may be the reason for a shortened above ground lifecycle and flowering period in some species.

DISTRIBUTION

Saprophytic orchids are distributed in all Australian states with a definite preference for the eastern seaboard. *Gastrodia sesamoides* (Plate 16) is the most widespread species within Australia, occurring in all states and the A.C.T. Whilst this may seem extensive, species such as *Epipogium roseum* can be found in many countries including Angola, Nepal, Japan, New Guinea, Australia and many more. In Australia it has been recorded at least as far south as the mid-north coast of New South Wales.

Other species such as *Gastrodia queenslandica* are localised being known from a relatively limited range in northern Queensland.

GENERA

In all about 15 genera have saprophytic species that occur in Australia. Some are limited to one such species and include, *Eulophia zollingeri, Prasophyllum flavum* (Plates 20 and 21), *Erythrorchis cassythoides* (Plate 45), *Arthrochilus huntianus, Genoplesium baueri* (Plate 26), *Cryptostylis hunteriana* (Plate 27), *Epipogium roseum* (Plates 18 and 19), *Pseudovanilla foliata, Didymoplexis pallens* and *Cheirostylis ovata* (Plate 22).

Genera like *Eulophia, Pseudovanilla* and *Erythrorchis* are interlopers in Australia having migrated from more northern regions. *Prasophyllum, Genoplesium, Rhizanthella* (Plate 17) and *Cryptostylis* are typically Australian genera that have developed, in part, a saprophytic dependency.

SOIL TYPES

As would be expected with such a diverse group of genera the types of soils in which these saprophytes grow are most variable. They range from humus rich rainforest soils through to swamps and hard ironstone and clays. They all however have one thing in common, an environment that supports the growth of the mycorrhizal fungi that these species require to survive and reproduce.

HABITAT

As with soil types, the habitats of saprophytes are particularly diverse and include the close, still and quite dark humid atmosphere one would expect to find at ground level in a rainforest through to the open *Eucalypt* forest where *Dipodium* (Plates 23–25 and 28, 29) typically occurs. *Burnettia cuneata* (Plate 30) occurs in wet swampy conditions at least at the northern limit of its distribution. Many of the saprophytic species grow in association with a particular genus or species of plant with which it forms a symbiotic relationship. Without this association all saprophytes would eventually perish.

POLLINATION AND SEED DISPERSAL

There is limited knowledge on the pollination of saprophytic orchids. Many do appear to be self-pollinating. A relatively short lifecycle in a given location severely limits the potential for long term observation.

Rhizanthella gardneri (Plates 3–7) is suspected of being pollinated by burrowing insects (Dixon, 1993). *Gastrodia sesamoides* appears to have a mealy pollen-like substance that may act as an attractant to pollen feeding insects.

After pollination saprophytic orchids have a number of interesting methods of seed dispersal, as do chlorophyll producing species. Two species that can grow under similar conditions in a rainforest environment but exhibit different techniques of seed dispersal are *Gastrodia queenslandica* and *Pseudovanilla foliata*. The former, a diminutive plant at flowering time, greatly elongates its inflorescence prior to capsule dehiscence in order to elevate the fruiting body to a point where there is sufficient breeze to disperse the seed over as large an area as possible. This should increase the chances of finding the appropriate fungi and maximise the chances of survival. By contrast the latter, which may grow to a height of 15m or more, has seed that has small wing-like features on the side. These wings act as a sort of parachute and slow descent allowing maximum time for dispersal.

Another interesting observation has been made with *Gastrodia sesamoides*. During flowering the flowers are pendulous. After pollination the capsule assumes an erect position. The inflorescence does not increase in height. Whilst the difference between erect and pendulous is minimal there must be some benefit to be gained for the plant to expend this energy.

Pollination and seed dispersal are interesting facets of our hobby and are worthy of continual research.

DEGREES OF SAPROPHYTISM

In orchids varying degrees of saprophytism are evident. *Didymoplexis pallens* and *Epipogium roseum* are quite obviously saprophytic, both exhibiting a lack of the green colouring one normally associates with living plants.

Others however are not as readily recognisable for what they are. Species like *Prasophyllum flavum* produce a leaf that is not significantly smaller than some other *Prasophyllum* and the plant is quite green in colour.

Another that produces a strong colouration is *Pseudovanilla foliata*. It also has a large, rigid leaf bract that makes the derivation of the specific name obvious. *P. foliata* does not completely die back during the nonflowering season.

It has been recognised for many years that some terrestrials are extremely difficult to sustain in cultivation even for a short period of time.

Caleana and *Calochilus* are but two examples that fit this description. Could it be that these genera are partially saprophytic in that they are able to photosynthesise in part but still rely to a large degree on a symbiotic relationship with the appropriate fungus for survival.

OBSERVATIONS

Saprophytism is a fascinating aspect of orchids and *Epipogium roseum* is among the more interesting of all the saprophytes.

The majority of tuberoid producing terrestrial orchids known to this author produce a new tuberoid either prior to, during or immediatley after flowering.

E. roseum apparently is the exception to this rule. Observations made of the plant toward the end of the flowering show the old tuberoid in an advanced state of decay and with no evidence of a new tuberoid at this stage.

One possible suggestion for this may be that once the tuberoid has decayed there remains a small dormant "eye" that becomes activated by some external factor such as summer rains. Once activated the tuberoid rapidly develops to maturity and is capable of providing sufficient energy to sustain flowering.

In this regard *E. roseum* seems to differ significantly from other terrestrials in that is appears to forego the security of reproducing vegetatively at the time of flowering and relying only on seed or on the gamble of a good season to guarantee survival.

Regardless of this apparent deficiency *E. roseum* is a survivor as can be seen from its remarkably wide distribution range. Throughout this range it remains stable which in itself is interesting as the genus has a relatively high chromosome count at 68. With this high count and the fact this species is autogamous one would expect a large degree of variation.

SOME AUSTRALIAN

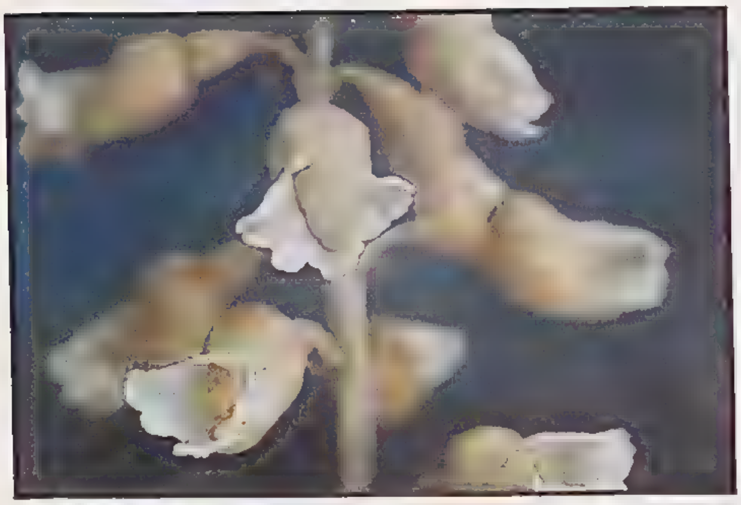


Plate 16: *Gastrodia sesamoides.* Photo: W. T. Upton.

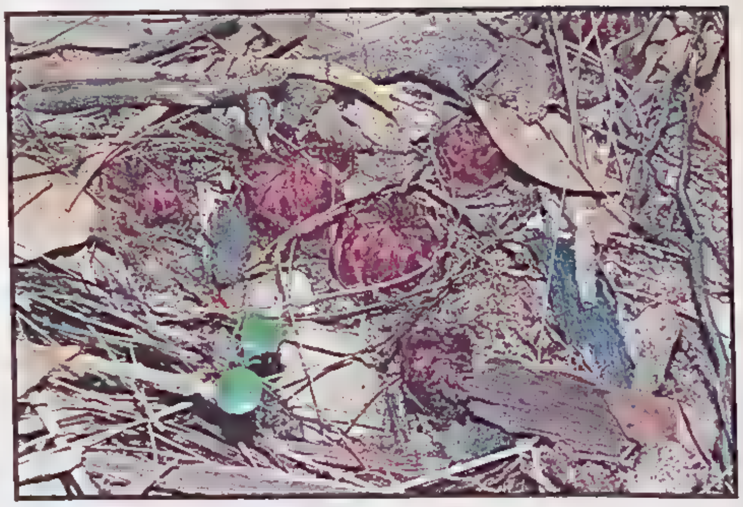


Plate 17: *Rhizanthella slateri.* Photo: D. Jones.

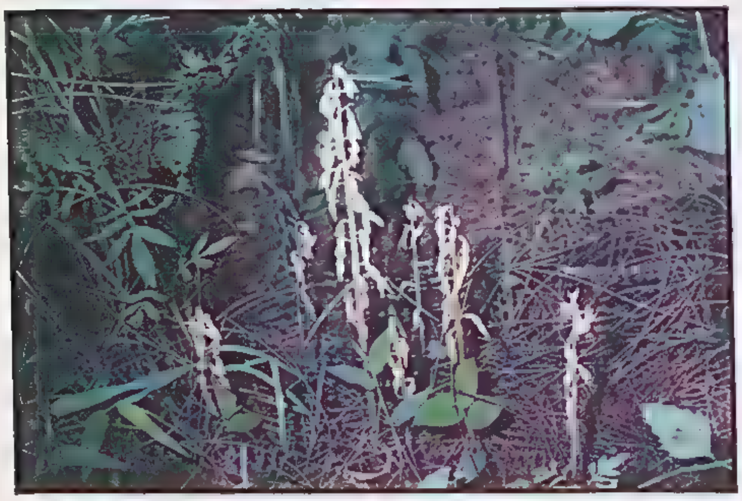


Plate 18: *Epipogium roseum.* Photo: L. Barton.

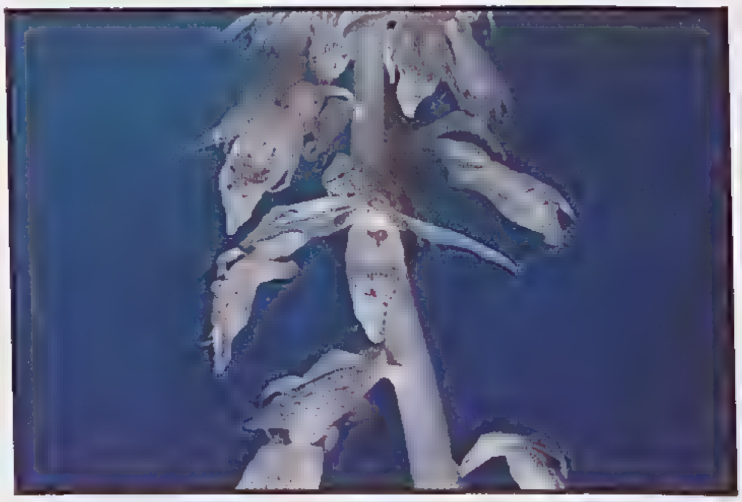


Plate 19: *Epipogium roseum.* Photo: L. Barton.

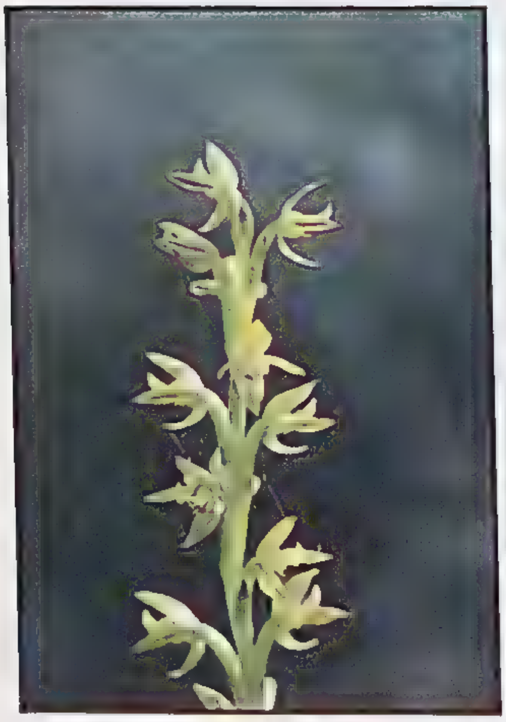


Plate 20: *Prasophyllum flavum.* Photo: L. Barton.

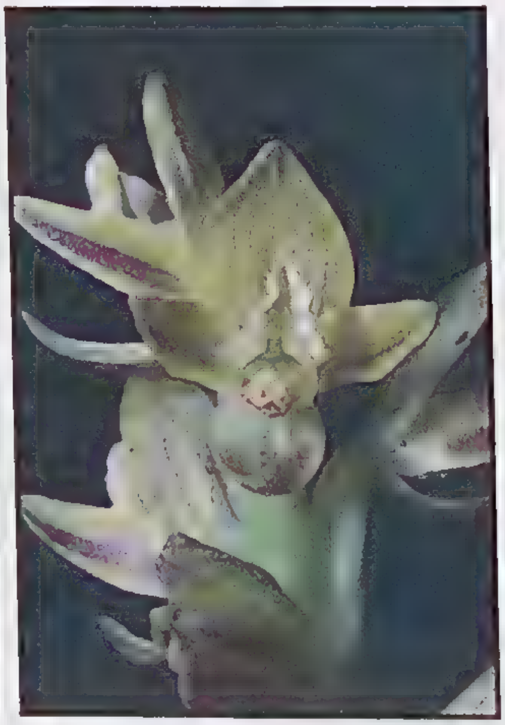


Plate 21: *Prasophyllum flavum.* Photo: L. Barton.

Plate 22: *Cheirostylis ovata.* Photo: P. Lavarack.

SAPROPHYTIC ORCHIDS

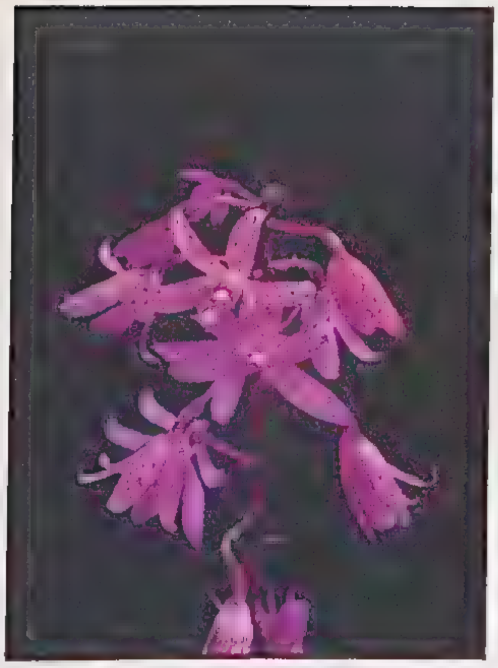


Plate 23: *Dipodium pulchellum.* Photo: L. Barton.

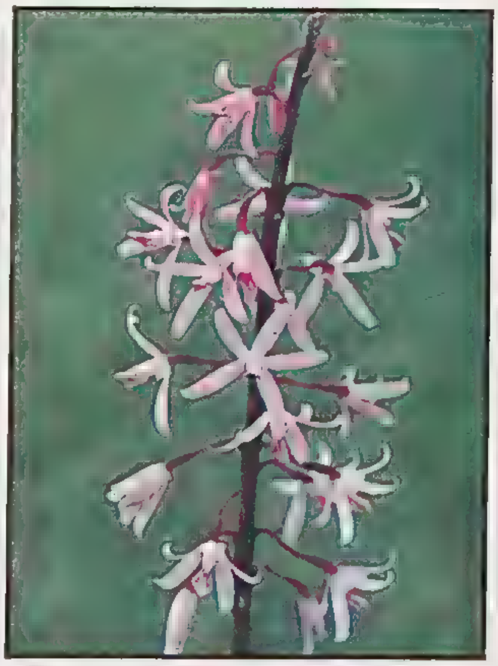


Plate 24: *Dipodium punctatum.* Photo: L. Barton.

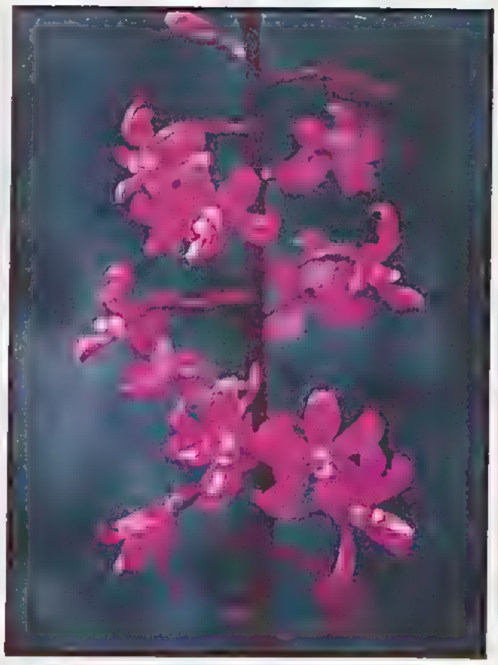


Plate 25: *Dipodium purpureum.* Photo: L. Barton.

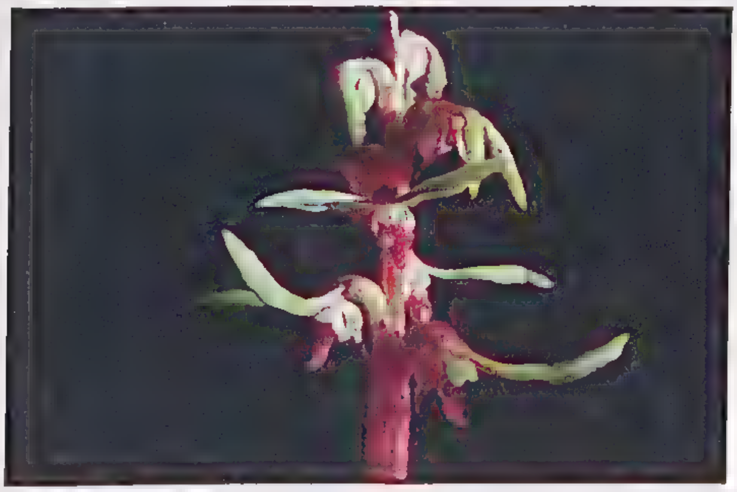


Plate 26: *Genoplesium baueri.* Photo: W. T. Upton.

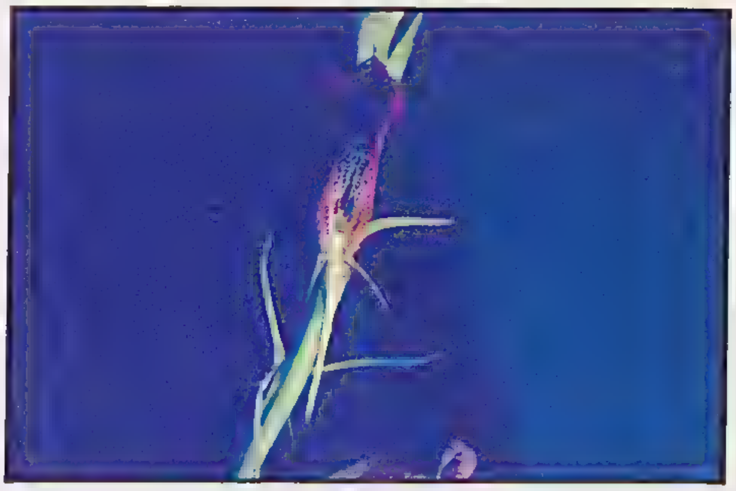


Plate 27: *Cryptostylis hunteriana.* Photo: W. T. Upton.

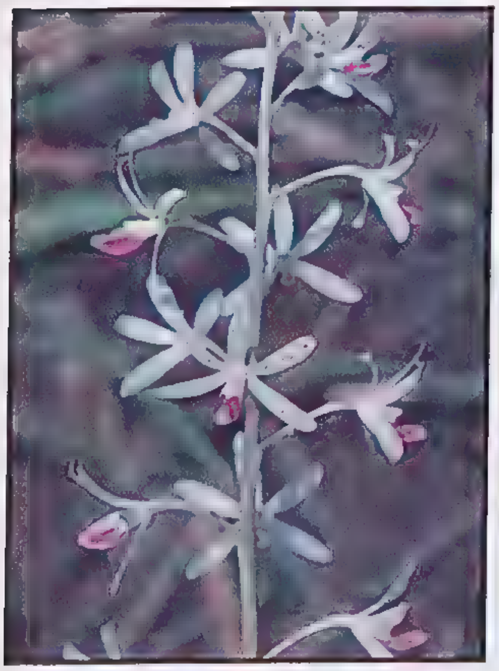


Plate 28: *Dipodium stenochilum.* Photo: D. Jones.

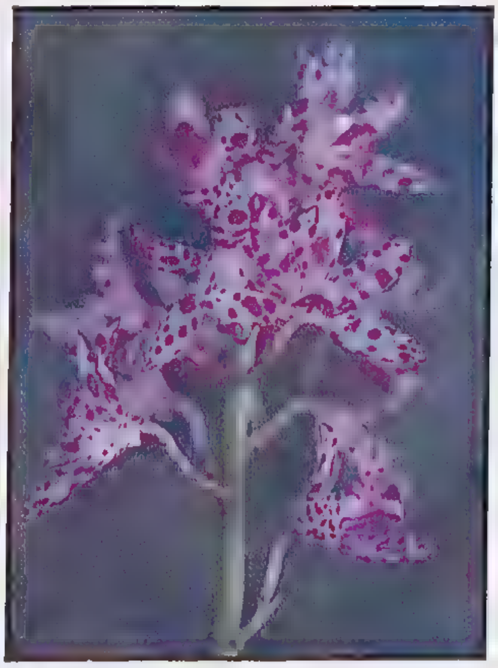


Plate 29: *Dipodium variesatum.* Photo: L. Barton.

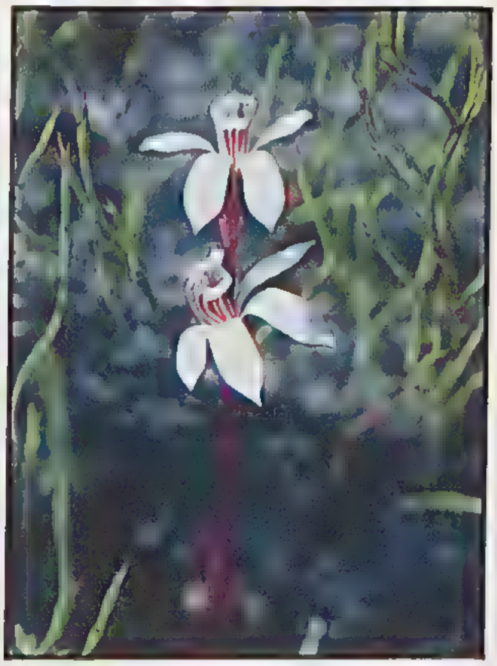


Plate 30: *Burnettia cuneata.* Photo: D. Jones.

COMMENTS

That saprophytes have posed a problem in classification is evident when one reviews the taxonomy of *E. roseum*. Since being first described by Don in 1825 it has been placed into a number of genera and been given numerous specific names.

Why has classification proven so difficult?

To understand the problems one needs to look no further than the character of the plants in question. Except for a very short period during flowering they, like most other terrestrials, survive in a dormant state underground.

However when they are flowering, which is often for an extremely short period, they lack the leaves which can be used as a diagnostic tool in classification.

As many of the species are self-pollinating it is difficult to determine column structure, again a valuable diagnostic feature.

The plants are also hard to maintain in cultivation and are often difficult to locate in the field. This has meant that there has not always been adequate material available for research.

REFERENCES

Dixon, K. W. 1993. Conservation of Native Orchids in Western Australia. Proc. Second Australasian Native Orchid Conference and Show, 91–95.

Dressler, R. L. 1979. The Orchid Natural History and Classification.

Jones, D. L. 1988. Native Orchids of Australia. ❦

SOME COMMENTS REGARDING THE IDENTITY OF THE AUSTRALIAN *VRYDAGZYNEA* SPECIES

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ABSTRACT

It is proposed that the Australian *Vrydagzynea* species is *V. elongata* Bl. and not *V. paludosa* J.J.Sm. Both taxa are newly recorded for the Bismarck Archipelago, *V. densa* Schltr. is suggested as a new synonym of *V. elongata* Bl.

The genus *Vrydagzynea* Bl. (subtribe *Goodyerinae* Klotzsch) consists of about 30 species distributed from Bangladesh to Samoa. Seventeen species have been described from New Guinea, but about only half appear to be valid entities. The troublesome taxa were sorted out by J. J. Smith (1929) who gave concise definitions of their characters. Based in part on Smith's paper, a study of some Schlechter types and examination of the ample material held at Lae I believe I have seen nearly all the New Guinea species (including two undescribed) with the exception of *Vrydagzynea truncicola* Schltr. and the obscure *V. papuana* Rchb.f.

I therefore suggest around ten is closer to the true number of New Guinean *Vrydagzynea*. in the following list probable synonyms are in brackets where the reduction is currently unpublished. *Vrydagzynea albostriata* Schltr., *V. argyrotaenia* Schltr. (*V. guppyi* Schltr.), *V. elongata* Bl., *V. neohibernica* Schltr., *V. nova-guineensis* J.J.Sm. (*V. chalmersii* Schltr.), *V. paludosa* J.J.Sm., *V. papuana* Rchb.f. (incertae cedis), *V. schumanniana* Krzl. and *V. truncicola* Schltr.

Good illustrations of nearly all these species may be found in Schlechter (1982), albeit some of the names are synonyms.

Vrydagzynea elongata Bl., Fl. Jav. Orch. 61, T.28, fig.1, 1858.

Type: New Guinea, Triton Bay, 1841, Le Guillou s.n. holo L.

Synonyms: *Vrydagzynea densa* Schltr., Fedde Rep. 17: 368, 1921.

Type: New Guinea, Waria area, Kempf S.N. holo B — destroyed.

Vrydagzynea sp., D. Jones, Nat. Orch. Austral. 351, 1988.

Vrydagzynea paludosa auct. non J.J.Sm.: D. Jones, Nat. Orch. Austral. 637, 1988: M. Clements, Austral. Orch. Res. 1: 147, 1989; A. Dockrill, Austral. Indigen. Orch. ed. 2, 1: 42, 1992; P. Lavarack & B. Gray, Austral. Tropic. Orch. 22, 1992. all pro parte, as to Australian record only.

Distribution: New Guinea, including the Bismarck Archipelago; Australia, north-east Queensland.

Material examined: Papua New Guinea – Markham R., Weinland 203 BRI!, NSW!; Bismarck Ra., 500m., 01-1902, Schlechter 14039 BM!, BR, K, NSW!, P; possibly same, Schlechter s.n. BRI!.

New Britain: sine loc. (Warangoi Valley?), Howcroft s.n. herb. Howcroft!; Hoskins subd., Nuau logging area, 167m., 22-02-1971, Lelean & Stevens LAE 51274 BRI!, CANB, K, L, LAE!; Hoskins subd., Kapiura R., ca. 1km. from confluence with Aum R., 20m., 16-05-1979, Sohmer et al LAE 75288 BRI!, K, L, LAE!, UPNG.

Australia – Queensland: Daintree region, Stewart Ck., Gray 3162 QRS! and Gray 4327 QRS!.

For the New Guinea mainland I have listed only historical collections. There is much more material at Lae of this, the commonest plant. J. J. Smith (1929) found *V. pachyceras* Schltr. and his own *V. rectangulata* conspecific. I have added *V. densa* Schltre. on the basis of the description.

When compared with other New Guinean *Vrydagzynea* this species is recognisable by its small flowers, the lateral sepals forming a right angle with the spur, the latter more or less cylindric, obtuse with the internal glands placed in the apical third. Inflorescences few to densely many-flowered, often elongating noticeably in fruit.

Vrydagzynea paludosa J.J.Sm., Bull. Dep. Agr. Ind. Neerl. 19: 39,1908.

Types: New Guinea, Noord R., 15-06-1907, Versteeg 1244 syn Bo: cult. Bogor, Djibaja 101 & 104 syn Bo.

Distribution: New Guinea, including the Bismarck Archipelago; Solomon Islands.

Material examined: Papua New Guinea – upper Bubui R. near Finschhafen, Weinland 252 BRI!, L. NSW!; Finisterre Ra., 700m., 13-01-1909, Schlechter 19083 E, K, L, NSW!; Njonge Ck. near Ambo, 9-01-1909, Schlechter 19043 E, K, L, MO, NSW!; Schlechter s.n., (Possibly = no. 14592) BRI!.

New Ireland: Danfu R. area inland from Manga, 244m., 6-02-1970, Eddy & Coode NGF 46082 LAE!.

Again I have only cited historical collections for the New Guinea mainland, there are only a few more recent finds at Lae. J. J. Smith (1929) found *V. rivularis* Schltr. conspecific, under which name it is recorded from the Solomon Islands by Lewis & Cribb (1991). Weinland 252 is the type number of *V. schumanniana* Krzl., however all duplicates other than the Berlin holotype have proven to belong here as already observed by Smith.

Characteristic for this species are its narrow lanceolate leaves sometimes seen in *V. elongata,* however the spur is strongly dilated and appears broadly fusiform with the internal glands placed perfectly in the middle.

The florally similar *V. neohibernica* Schltr. may be distinguished by its robust leafy habit and broader ovate– elliptic lanceolate leaves.

ACKNOWLEDGEMENTS

I wish to thank Neville Howcroft for loaning me his collection of *V. elongata* and accommodation in Papua New Guinea, herbarium and library staff at BM, BRI, LAE, NSW and QRS.

LITERATURE CITED

Lewis, B. A. and Cribb, P. J. 1991. Orchids of the Solomon Islands and Bougainville. Royal Botanic Gardens, Kew.

Schlechter, R. 1982. The Orchidaceae of German New Guinea. English translation, Edit. D. Blaxell. AOF, Melbourne.

Smith, J. J. 1929. Nova Guinea 14: pp509–511.

*

CONTEMPLATE THIS THOUGHT

In badly drained containers, growth is impaired due to lack of oxygen. The vital processes of the roots are dependent on an adequate supply of oxygen. In most cases wet growing media are cold and not conducive to strong healthy growth. Also, poisonous compounds are developed in the media when there is a lack of oxygen.

*

AUSTRALIAN DENDROBIUMS IN SOUTH AFRICA

Plate 31: New greenhouse 1993. Cost about R6000.

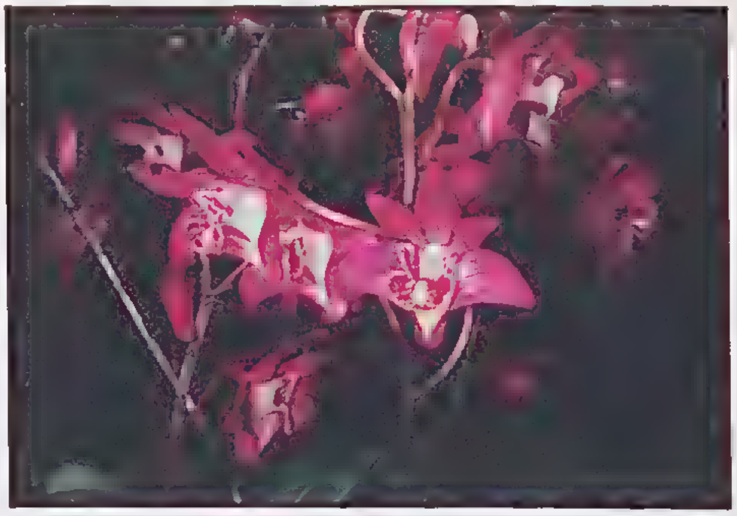


Plate 32: *Dendrobium kingianum* 'Stan' AM/SAOC.

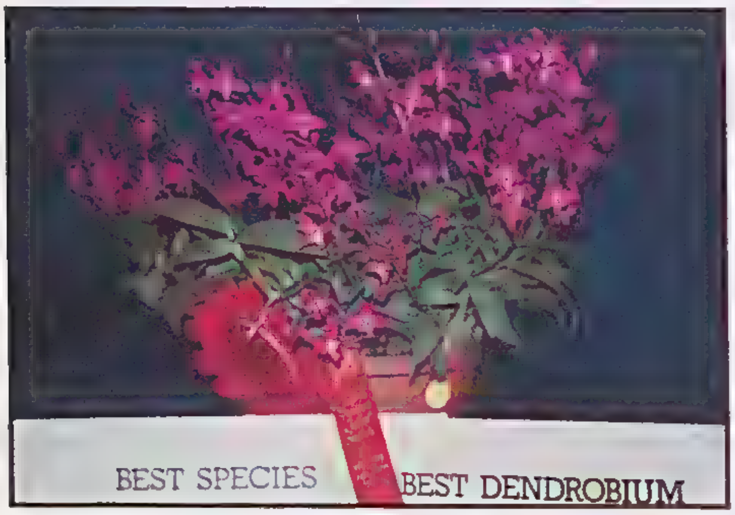


Plate 33: *Dendrobium kingianum* 'Wedge' AM/SAOC.

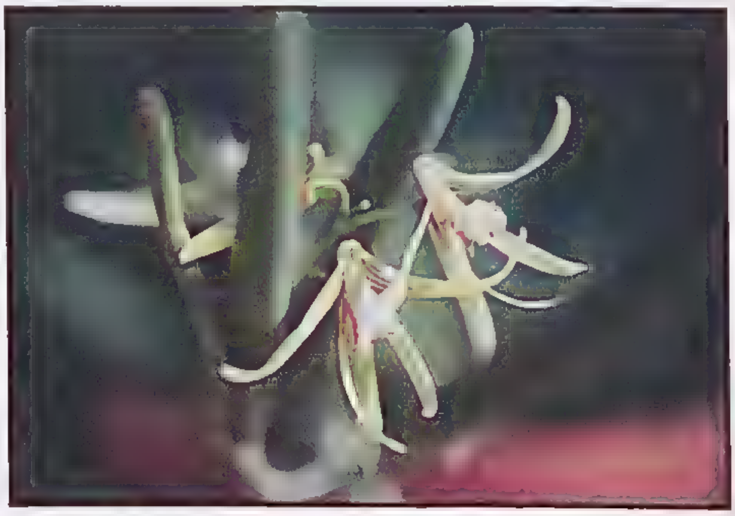


Plate 34: *Dendrobium cucumerinum* 'Bill' X *D.* Goose Bumps.

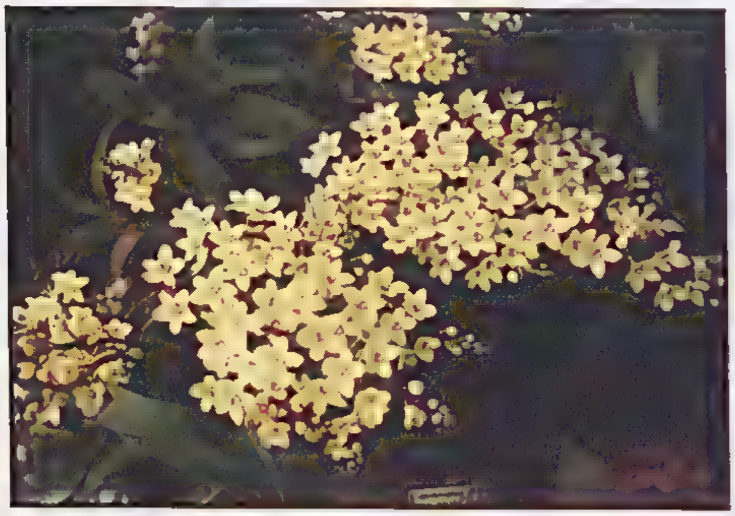


Plate 35: *Sarcochilus hartmannii.*

Photos: S. Wedge

RECENT A.N.O.S. AWARD

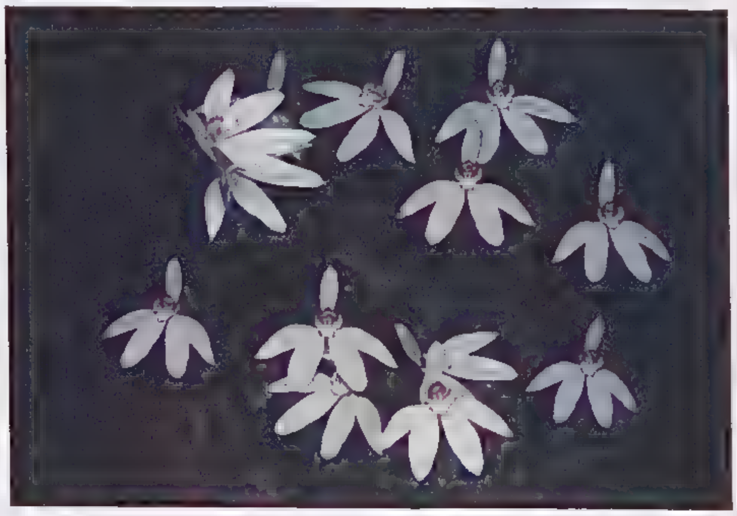


Plate 36: *Caladenia carnea* 'Suzanne' ACC/ANOS.
Photo: D. Titmuss.

GROWING AUSTRALIAN *DENDROBIUM* HYBRIDS AND SPECIES IN PORT ELIZABETH, SOUTH AFRICA

Stan Wedge
27 Kragga Kamma Road, Framesby
Port Elizabeth, South Africa 6045

I have been growing orchids since 1978 and have since attended four world orchid conferences.

It was while I attended the 13th W.O.C. in Auckland that I was honoured to assist the judges panel in the Australian *Dendrobium* class and to crown it all I had the master of judges in this class, Mr Walter T. Upton himself as the chief of the panel.

As a South African learner judge, it turned out to be the best lesson and most pleasant I have ever had the privilege of taking part in. Every point and detail of a plant judged was explained and each question asked was immediately answered after the plant had been judged. What a great lesson!

Having grown soft and hard cane dendrobiums before, it was the beauty of the Australian species and hybrids that stunned me to the core; so much so that I could hardly take my eyes off them in amazement. I thus decided to buy a few seedlings and together with the flasks given to me, I guarded them with my life through customs until I reached home.

May I take this opportunity to tell you a little about our city. It was discovered in 1488 by Bartholomew Diaz, a Portuguese navigator and only got its name more than 300 years afterwards in June, 1820, when the then acting governor of the Cape, Sir Rufane Donkin, visited the settlement and asked that it be named after his young wife — "one of the most perfect of human beings" — who had recently died in India. From that tiny settlement has grown the Port Elizabeth of today, a thriving city of 616,700 inhabitants with a municipal area covering more than 418 square kilometres. It is called — The Friendly City. The average rainfall, falls in winter and is 610mm. The average daily sunshine hours are 7.9. The average maximum temperature is 22.1° celsius and the average minimum 12.7°C. The average daily temperature is 16.9°C and the average wind speed is 16.1kms per hour. For about five months, i.e. January to the end of May, we have very light winds. Strong winds during the winter months, June to November. In winter the night temperature can fall to 1°C and in summer can rise up to 40°C during the day. One of the main problems in summer is the humidity which can fall to as low as 10, which needs a lot of misting to keep the shadehouse at 60.

On the growing side, against all expectations, not knowing the Australian climatic conditions, I have been extremely successful in growing dendrobiums:–

> *Dendrobium kingianum* 'Fire 107' X self – a large pink flower of 35mm; *D. kingianum* 'Red' X *D.* Ella V. Leaney; *D. kingianum* var. *silcockii*; *D.* Bardo Rose 'White Speck'; *D.* Rutherford Surprise; *D.* 'Dungog'; *D.* Gillian Leaney X *D.* Peter; *D.* Star of Riverdene; *D. kingianum* X *D.* 'Glenreagh' X *D.* 'Silcockii' 'W'; *D. kingianum* 'Bungan Castle' X *D. kingianum* 'Lindsay' X *D. kingianum* 'Wayside'; *D. falcorostrum; D. kingianum* 'Alba'; *D. cucumerinum* 'Bill' X *D.* Goose Bumps (Plate 34); *D. pugioniforme*; *D. linguiforme*; *D. tetragonum*.

All these plants I brought at the First Australian Native Orchid Conference held at the University of Wollongong in 1990 and to date I have received two awards, namely The Species of the Year 1993 by the S.A.O.C. with *D. kingianum* 'Stan' AM/SAOC (Plate 32) with 83% and Best *Dendrobium* Species on show at the Eastern Province Orchid Society Show and Conference in Port Elizabeth with *D. kingianum* 'Wedge' AM/SAOC (Plate 33) 82%.

These results were mainly obtained by me following the growing instructions printed from time to time in the Orchids Australia magazine to which I am a subscriber.

My orchids are grown under local climatic conditions in a shadehouse having 45% shade cloth sides and a pitched polycarbon roof of 45% (Plate 31).

I also grow other genera (Plate 35) successfully under the same conditions but with different potting media and feeding habits. I also have a lamina-flow and do my own selfing and flasking. ✻

Ed.—Reprinted from the *Woman Today* liftout section of the Papua New Guinea POST–COURIER for Thursday, 17th March, 1994.

HONOR FOR ALEXIA BURNS: PNG'S LADY OF THE ORCHIDS

PNG's first hybridised orchid registered internationally, it is named after Lexy

By Ruth Waram

PNG has now made its presence felt at the international orchid arena with the registration of the first PNG bred and grown hybrid orchid.

The *Dendrobium* Lexy Burns is a cross breed of *D. williamsianum* which grows around Port Moresby and *D.* Bangkok Blue, which came from Bangkok, Thailand.

D. Lexy Burns is named after the patron of the PNG Orchid Society Mrs Alexia Burns (commonly known as Mama Lexy).

Mrs Burns has been involved with the PNG Orchid Society since its establishment in the early '70s.

According to Ms Sylvia Aiba of Sogeri Orchids who bred *D.* Lexy Burns, this is the first time that a hybrid orchid was bred in PNG and has been registered with the Royal Horticultural Society in England.

Ms Aiba said that in the past, people had taken orchid species out of PNG, hybridised them and then registered them as being from whichever country they were grown in.

She said they decided to name the orchid after Mrs Burns because of her long term involvement with the PNG Orchid Society.

Apart from having an orchid hybrid named after her, Mrs Burns will also have two new orchid houses at Port Moresby's Botanical Garden also named after her.

The ceremony will take place at the University Botanical Garden this morning.

The Orchid Society will also present a K2500 cheque to the Botanical Garden to look after the Alexia Burns Orchid Houses.

Funding for the construction of the new orchid houses were provided by NCDC.

Mrs Burns, who turns 73 in June, is the current owner and manager of the famous Galley Restaurant in Port Moresby, something she has been doing since 1975.

"I've always loved orchids. The very first time I saw an orchid, I fell in love with," she said.

"And I've always loved Papua New Guinea and been amazed by the sheer number of orchid species there are in this country," Mrs Burns said.

"It is a great honor (to have an orchid hybrid and two orchid houses named after her) to a great friend (Ms Aiba) of mine. Actually, it is a real credit to her," she told *Woman Today*.

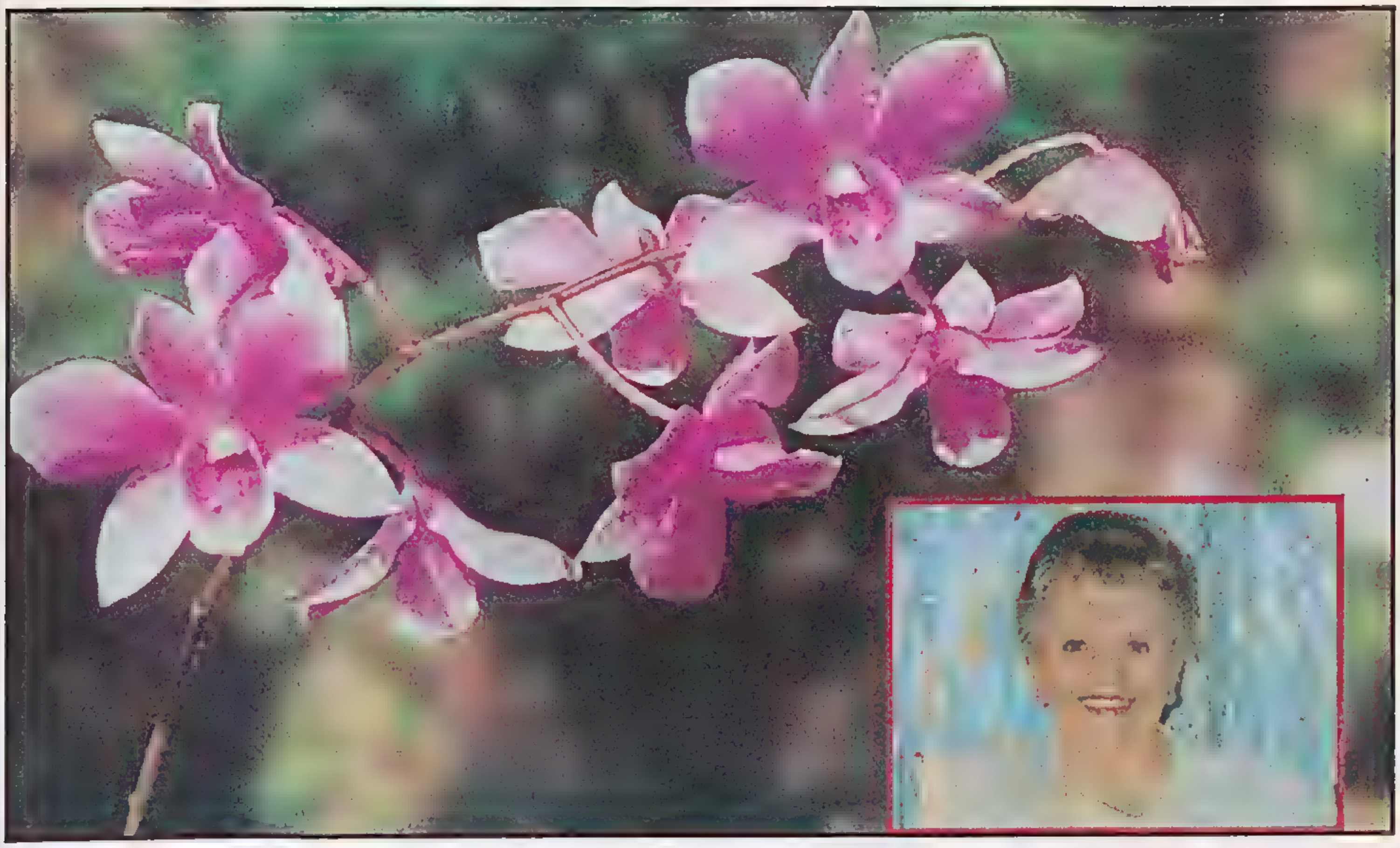
Mrs Burns has lived in PNG since 1947. She was one of the first single women to come from Australia to PNG after the war and married here in 1955, She has a daughter in Australia.

Apart from managing her restaurant, Mrs Burns is also involved with the City Mission Group.

And during her time in PNG, she has catered for some very important people.

To name a few, she catered for Prince Andrew during his visit to PNG for the 1991 South Pacific Games, hosted a lunch and afternoon tea for the Queen during her visit here in 1985 for the tenth anniversary celebrations.

She also hosted a dinner for Princess Anne and her former husband at the Yacht Club during their visit too. ✾



The *Dendrobium* Lexy Burns. Inset: Mrs Alexia Burns.

Ms Sylvia Aiba who bred the orchid. Picture supplied by Sogeri Orchids.

Lexy: PNG's 'Lady of orchids'

LONG time patron of the PNG Orchid Society Mrs Alexia Burns is a very proud woman.

She has been honoured with having a hybrid orchid and two orchid houses in Port Moresby named after her.

The hybrid orchid, *Dendrobium* Lexy Burns was hybridised by Ms Sylvia Aiba of Sogeri Orchids.

D. Lexy Burns is the first hybrid orchid from PNG to be registered with the Royal Horticultural Society in England.

Ed.—Reprinted from the *Proceedings of the Second Australasian Native Orchid Conference.*

NEW DIRECTIONS IN HYBRIDISATION WITHIN THE AUSTRALASIAN MEMBERS OF THE GENUS *DENDROBIUM*

David P. Banks
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39 Carole Street, Seven Hills, N.S.W. 2147

INTRODUCTION

It is 101 years since the first Australian native orchid hybrid was registered. History reminds us that this was a mating between *Dendrobium speciosum* and *D. kingianum,* aptly named *D.* Specio-kingianum by Sir Trevor Lawrence in 1892.

More work has been done with the hybridising of Australian orchids over the past decade than the proceeding 90 odd years.

This is for a number of valid reasons:–

- There are more enthusiasts and nurseries both locally and internationally who are interested in these plants.
- Much has been written about successful cultivation techniques and generally most hybrids are quick to mature (or at least give a preview flowering on very small plants) and easy to grow if there basic requirements are met.
- With a selection of modern hybrids, growers can have plants in flower all year.
- "Tropical"-looking flowers can be produced on plants that require no artificial heating in winter in temperate climates.
- Many of the original hybrids were the progeny of bush-collected plants and often from random pollinations. Thanks to the line-breeding of a number of our horticulturally attractive species, these hybrids are being remade using vastly superior stock.
- In fact, the increase in quality has been so fast and intense that seedlings that were "raved over" five years ago are now appearing on the sales benches in flower for very low prices.
- An increase in A.N.O.S. groups, particularly along the east coast of Australia are providing a meeting place for growers and hybridisers to share ideas, plants, pollen and engage in the healthy discussion of their beloved orchids.
- And, most importantly, conferences such as this to bring together enthusiasts from coast to coast and overseas.

This paper will be focussed on developments within the section *Dendrocoryne* and its inter-sectional hybrids.

Dendrobium, Section *Dendrocoryne*

This group are often referred to as the cool-growing native dendrobes. As you will see there are only ten species in this section, plus a number of varieties and sub-species. All of these plants have been used in hybrids with varying degrees of success.

It is worth noting that *D. kingianum* is the only pink/mauve flowered species in this section, which highlights the colour dominance it has in hybrids.

These floriferous plants will always be popular with experienced growers plus newcomers to our hobby.

As touched on earlier, many of the older hybrids are being remade using significantly improved parents, with more thought going on before pollination takes place. This may pose a problem for purists who prefer the "wild" version, arguing that selective breeding manipulates the gene pool of the species.

I believe it is of utmost importance to continue to "self" and reproduce plants from known wild populations and be meticulous with their labelling and documentation. So that if, for whatever reason, the species becomes exterminated from a given locality, plants from the same genetic pool can be reintroduced at some stage. This is as important for *Dendrobium* as it is for other Australian (and exotic) genera and species (for esample, *Sarcochilus hartmannii* from precise locations such as Blue Knob, Mt Lindesay, Numinbah Valley, etc.).

Back to the linebreeding. At present *Dendrobium kingianum, D. speciosum* and *D. tetragonum* have received most of the attention from hobbyists and some fine horticultural clones have been produced. Some of the people involved in this work include Sid Batchelor, Neil Finch, Alwyn Flannigan, Ted Gregory, Michael Harrison, Phillip Spence, Ken Russell, Kevin Wilson, John Woolf and myself. Some of this work is now in its 4th and 5th generation for the fast maturing *D. kingianum,* whilst we have not seen the full potential for the slower growing *D. speciosum* complex.

It is worth remembering that by producing vast numbers of a given species from seed, particularly if it is a horticulturally superior form, then this must help to take some of the strain off wild populations as far as orchid growers (collectors?) are concerned. Habitat destruction and wholesale (often illegal) pilfering may regrettably be a factor largely out of our control.

A problem we are starting to face and timely needs to be addressed, is the naming of some of the progeny when different varieties or sub-species are mated together. Many of these have flowered and are being used to make further hybrids. This is already posing a problem with nursery raised *D. speciosum* and *D. tetragonum*. What do we call them?

I will now briefly discuss the Australian *Dendrocoryne* dendrobiums, imparting my views and their use in hybrids:–

Dendrobium adae Bailey

This north Queensland species would arguably have the most gorgeous perfume of any orchid. Colours range from golden tones through creams to apple greens. Rarely used in hybrids mainly because overall the plant has poor floriferousness. Only a small percentage of the mature pseudobulbs flower in most clones. Its best hybrid is *D.* Leonie Jane (*D. adae* X *D. falcorostrum*), with its white to cream heavily perfumed flowers.

Dendrobium aemulum R.Br.

A reliable early flowerer, often the first in the season. Large plants are showered in hundreds of white feathery flowers. Little has been done with this epiphyte, the old standby *D.* Emmy (*D. aemulum* X *D. kingianum*) is sometimes seen in larger collections. Hybrids are probably best grown on mounts as *D. aemulum* resents having its roots covered. I have tried, as yet without success, to mate *D. aemulum* with *D. speciosum* subsp. *grandiflorum* to hopefully produce a consistently floriferous plant, as *D. speciosum* is not always a consistent flowerer.

Dendrobium falcorostrum Fitz.

A high altitude (well, for Australia anyway) species which doesn't enjoy high temperatures in summer. Another perfumed white flowered species which doesn't seems to vary a great deal. Main differences are in flower size. I have always found it difficult to set pods on this species and have used it as a pollen parent. *D.* Bardo Rose (*D. falcorostrum* X *D. kingianum*) will always be popular with growers of specimen plants.

Dendrobium fleckeri Rupp *et* C. White

An important early summer flowering species with orange to brick red flowers produced singularly or in pairs in most clones. Passes on very good shape to progeny. It is in the background of many fine cream to apricot-yellow hybrids, e.g. *D.* Sunglow (*D. fleckeri* X *D. speciosum*) and the pink (or rarely creamy-yellow) *D.* Hastings (*D. fleckeri* X *D. kingianum*). Its lack of floriferousness and poor labellum has restricted its use in primary hybrids. Some of these hybrids can be slow growing and lack strength, so thought must go into using vigorous stock.

Dendrobium gracilicaule F. Muell

The parent of the popular natural hybrids *D.* X*gracillimum* (*D. gracilicaule* X *D. speciosum*) and *D.* X*suffusum* (*D. gracilicaule* X *D. kingianum*). Even though its colouring is unique, it is rarely used due to its short spikes and small flowers.

Dendrobium gracilicaule var. ***howeanum*** Maiden

Used slightly more than the type variety, this Lord Howe Island endemic has larger flowers and lacks the spotting on the back of the flowers. *D.* Golden Fleck (*D. gracilicaule* var. *howeanum* X *D. fleckeri*) was made using this variety.

Dendrobium jonesii Rendle

Rarely used in hybrids with its bunched cream flowers, favour being given to the larger and later flowering *D. jonesii* subsp. *magnificum.* Well known for many years by its synonym – *D. ruppianum,* which is still used by the Royal Horticultural Society for registration purposes.

Dendrobium jonesii subsp. ***magnificum*** Dock.

Formerly well known as *D. ruppianum* forma *magnificum.* The pure white flowers (which age to a creamy yellow) can have tepals up to 50mm long. The labellum can be either pure white or display a fine network of mauve markings. It has been used in a large number of hybrids and its size is passed onto its progeny. Two of its most popular hybrids are *D.* X*ruppiosum* (with *D. speciosum*) and *D.* Eureka (with *D. fleckeri*). Unfortunately the flowers often close up to a great extent in cool and/or dull weather. For this reason many hybrids don't look at their best at many nighttime meetings or shows.

Dendrobium kingianum Bidw. ex Lindley

A most important species, being the backbone of many breeding programmes and in the ancestry of all pink and mauve flowered *Dendrocoryne* hybrids. Many first generation hybrids have proved to be sterile but this could be the result of triploids being produced.

One of the most variable of the Australian dendrobiums, being found in whites, bi-coloured forms such as whites with mauve labellums ('var. *silcockii*') and pale pinks with white labellums, lilacs, soft to deep pinks, mauves, purples to deep beetroot shades. We now have clones with speckled flowers (e.g., 'Speckles' and 'Freckles') and plants with solid coloured labellums (e.g., 'Steve').

Despite the fact that the deeper coloured forms are referred to as 'red', this is misleading (and frustrating) for new growers who go looking for plants with fire engine red flowers.

Dendrobium kingianum is very dominant in flower colour and flower size when used in hybrids even though this colour is sometimes diluted. When crossed with yellow, apricot or cream coloured flowers you will get 100% (or very close to) pinks. Many hybridisers will testify to this.

Apart from line bred plants, the best horticultural forms appear to come from Gloucester, Lansdowne/Comboyne and Wauchope in New South Wales and from the Lamington/Numinbah Valley and Toowoomba in southern Queensland. Growth habit is as varied as the flowers with pseudobulb size varying from 2cm to 80cm and two to 20 flowers.

Being a vigorous grower, specimen plants can be obtained with good culture. Thankfully this vigour is also passed onto its children and there are quite a number of choice hybrids with *D. kingianum* in the background.

Some of the best cultivars include: 'Albert West', 'Allison', 'Betty', 'Boundary King', 'Captain Midnight' AD/AOC-NSW, 'Corrigans Red', 'Ha Ha', 'Iced Vo-Vo', 'Inferno', 'Jannine', 'Josephine' HCC/AOC-NSW, 'Linda', 'Lipstick', 'Roy' AD/AOC-QOS, 'Speckles' HCC-AD/ANOS, 'Steve' AD/ANOS, 'Tungsteds Pink', 'Warren', 'Wayside' and 'Winston Hills'.

I appreciate there would be other excellent clones which I have not yet seen and fine seedlings which flower annually. In fact, one could have a fine collection if they concentrated solely on this orchid.

Dendrobium moorei F. Muell.

Endemic to Lord Howe Island, its crystaline white flowers are unusual in having a labellum very similar to the rest of the floral segments. The hybrid with *D. kingianum* is not very impressive, but does tend to flower when not much else is out. Selfings and outcrosses should be more encouraged, as this species has a very restricted distribution in the wild.

Dendrobium speciosum Smith

One, if not the, most impressive orchid species of the world and probably my personal favourite. Its natural distribution is from the Cann River region of Victoria, north to Munghorn Gap (inland) and Alum Mt. (coastal) in New South Wales. This strong but slow growing plant has been the backbone of many hybridising programmes.

It appears to flower well every second year, with a bumper year every four. This has proved correct for 1985 and 1989 and judging from the flower spikes as I'm writing this, 1993 looks like following this pattern.

Many of its hybrids produce large flowers and quite a number of them on strong upright to arching spikes. A number of growers (and judges) do not like the arching sprays. this does not worry me as long as the flowers are well displayed and individually look at you.

D. speciosum has a well marked labellum that is poorly displayed due to its shape, which after all is designed to lure potential natural pollinators, not orchid fanciers. When crossed with *D. tetragonum* var. *melaleucaphilum* (to make *D.* Hilda Poxon), this lovely labellum is flattened out to show off its colouring to its best advantage.

Some of the more choice clones include 'Awesome', 'Black Friday', 'Charlie' AM/AOC-NSW, 'Cindy', 'Glennynes', 'Kath' HCC/AOC-NSW, 'Kathryn', 'Little John' HCC/AOC-QOS, 'Lynette', 'National White' HCC/AOC-NSW, 'National Cream', 'Neville', 'Storm', 'Warrior', 'Windermere', 'Yarrabin' and 'Yarramalong'.

A few of the better spotted/blotched clones include 'Firecracker', 'Krakatoa' and 'Tiger Tiger'. Another interesting clone is 'Walrus', which is unusual in having a labellum similar to the other sepals.

Dendrobium speciosum subsp. ***capricornicum*** S. C. Clemesha

Not well known in collections, unfortuantely many are errorously labelled. With a natural distribution around the Tropic of Capricorn, this subspecies early flowering traits (for the coastal form) and compact growth may tempt hybridisers. The flowers are often on the small side in whites and creams.

Dendrobium speciosum subsp. ***curvicaule*** Bailey

Only just starting to be used in hybrids. This north Queensland subspecies has arguably the best labellum of the *D. speciosum* complex and the finer clones have very meaty flowers with broad segments.

A few of the best Eungella Range cultivars include 'Clarrie', 'Liberty' and 'Outland', whilst the spotted clone 'Margaret Healy' has created a lot of attention. We will see this subspecies used more.

Dendrobium speciosum subsp. ***grandiflorum*** Bailey

This south-eastern Queensland subspecies has become very popular with native orchid growers over the past decade as plants have become more readily available. Generally the more horticulturally attractive clones come from the northern part of its range, often as lithophytes.

This is now being used to remake a lot of the older *D. speciosum* hybrids and has not been neglected in regards to linebreeding. Half a dozen of the best clones are 'Grand Mel', 'Kroombit Gold' HCC/AOC-QOS, 'Ludlows

Giant', 'Mt Larcom Gold', 'Parade' and my choice, 'The King'. These produce long inflorescenses of impressive large golden yellow flowers, which deepen with age.

Dendrobium speciosum subsp. ***hillii*** Bailey

With a natural distribution from central New South Wales to southern Queensland, the subspecies can grow into massive clumps. The parent of a few natural hybrids but not really considered for man-made hybrids due to its small flower size. Individual inflorescences can produce 300 flowers in some clones, however the hybrids rarely produce 15% of this.

Dendrobium speciosum subsp. ***pedunculatum*** S. C. Clemesha

A compact growing taxa from the tablelands of north Queensland. This subspecies was poorly known until a decade ago when the interest in the *D. speciosum* complex escalated, largely due to a couple of landmark articles by Stephen Clemesha and this has been maintain to the present day.

One of the big advantages when used as a parent is that the seedlings are a lot quicker to mature and maintain their compact habit. It will be interesting to see what is produced from the cultivar 'Royal Purple', which has dark maroon markings over half the flower.

Dendrobium tetragonum Cunn.

Rarely used, favour being given to the larger flowered varieties. Was in fact used for Wilhelm Schmidt's original *D.* Ellen (*D. tetragonum* X *D. kingianum*) cross back in 1928. Some of these small flowered clones have rich brick red to chocolate markings bordering the sepals.

Dendrobium tetragonum var. ***cacatua*** M. Clements et D. Jones

Errorously known for many years as *D. tetragonum* var. *hayesianum*, (this actually was an albino clone of the type variety from the Illawarra Region, N.S.W.). This high altitude variety from north Queensland has predominantly green flowers with a pure white labellum. Has been used in remakes of the hybrids *D.* Ellen and *D.* Hilda Poxon with limited success.

Dendrobium tetragonum var. ***giganteum*** P. A. Gilbert

Endemic to the Cape York Peninsula region of north Queensland. Whilst it will grow cool in temperate climates, it does do better with a little warmth in winter. This is the variety that has been used almost exclusively in the hybrids with *D. tetragonum* in their background. Its progeny seem to have two flowering seasons. One in mid-winter and the other in late spring, however flowers can be expected spasmodically throughout the year.

A 'pink-lipped' form which was distributed in the late 1970s by Noel Jupp has produced an array of hybrids which have solid coloured to suffused labellum markings. This has proved a dominant feature which is carried into second and third generation hybrids.

I believe that this is the key orchid in our quest for quality Australasian hybrids. It will readily hybridise with all members of section *Dendrocoryne* and there are registrations of *Dendrobium tetragonum* with various representatives of the sections *Spatulata, Latouria* and *Phalaenanthe.* This species may be the "go-between" of the various sections.

Dendrobium tetragonum var. ***melaleucaphilum*** M. Clements et D. Jones

This has been in collections for years, often referred to as the "mid-north coast" form of *D. tetragonum*. It has since been recorded from the Blue Mountains in N.S.W. and southern Queensland. One of our pioneer hybridists, Walter T. Upton, was one of the first to exploit the breeding potential of this variety. It passes on its large size and impressive flared labellum to all of its progeny. Many of the early *D. tetragonum* hybrids have since been remade using this variety. This taxa is spring flowering and does not flower spasmodically like *D. tetragonum* var. *giganteum.*

[Ed.—Space does not allow for copies of all slides shown at Toowoomba to be published — some of the slides of straight *Dendrocoryne* hybrids shown were]:–

Plate 37: *D.* Regal Affair
Plate 38: *D.* Warrambool 'Lipstick'
Plate 39: *D.* Warrior 'Goliath'
Plate 40: *D.* Warrambool 'Star Dust'

INTERSECTION AUSTRALIAN *DENDROCORYNE* HYBRIDS

Great inroads have been made with these "hot-cold" hybrids over the past four or five years. Many hybrids have proved difficult to get to the pod stage and even harder to get good (if any) germination in the flask.

I believe the two "link" species, which are used as a bridge between the various sections, will be *D. bigibbum* and more importantly *D. tetragonum*. It is therefore no surprise that the hybrid between those species, *D.* Peewee, is also being used a lot as a parent now with a whole host of partners.

Over ten years ago the late Jim Rentoul told me what a breakthrough this hybrid was and that it would revolutionalise native orchids. I think he was right. Just to throw a spanner in the works, a lot of the older clones of *D.* Peewee are of suspect parentage. I believe there may be some foreign blood in there somewhere. *D.* Peewee has been remade a number of times since — and none of these remakes bare any resemblance to the "original" hybrid.

The next step has been to link the *D. bigibbum* line with the *D. speciosum* line and we already have a number of choice hybrids. A recent hybrid of Phillip Spence's is a mating between the compact form of *D. bigibbum* and *D. falcorostrum* (Plate 42). This has produced a genuine cool growing plant with "tropical" looking flowers. There is still a long way to go with this line of breeding. Many of the hybrids will grow and flower in the bushhouse, but they perform slightly better if availed a little warmth or protection in winter.

Some of the people following the "hot-cold" line are Sid Batchelor, David Butler, Neil Finch, Bernie Fletcher, Ted Gregory, Michael Harrison, Laurie Jarvis, Issy Klein, Alan Peck, Ken Russell, Keith Skaines, Bill Skillicorn, Phillip Spence, Walter T. Upton, John Woolf and myself. We will witness huge improvements over the coming years.

[Ed.—Some of the slides shown were]:–

Plate 41: *D.* Brolga
Plate 42: *D.* Colonial Maid
Plate 43: *D.* Elegant Heart 'Blue Tongue'
Plate 44: *D.* Rosella 'Red Giant'

OTHER SELECTED *DENDROBIUM* HYBRIDS

I can see a future where the somewhat neglected north Queensland cool growing *D. agrostophyllum* from Section *Trachyrhizum* will play a greater role in further hybrids. Only a few have been made and registered to date, however all of these are most appealing, with very fine shape. The flowers last for about two to three weeks on the plants and some of the hybrids are sequential flowering in the cooler months. Many flower again in late spring. The following hybrids are certainly worth space in the collection:–

AUSSIE OCHRE
(*D. agrostophyllum* X *D. speciosum*)
BILL LONNE
(*D. dicuphum* X *D. agrostophyllum*)
PINK BALLERINA
(*D. agrostophyllum* X *D. bigibbum*)
RED BALLERINA
(*D.* Pink Ballerina X *D. bigibbum*)

There has been a constant trickle of "terete-leafed" hybrids. Most of the better ones have *D. linguiforme* var. *nugentae, D. striolatum* and *D. teretifolium* in their pedigree. A plant well known as "*D. teretifolium* 'Black Pam' " has been used in a number of crossings. This is from a plant that Phillip Spence collected in Papua New Guinea. So its hybrids should not be benched in Australian classes. It appears to lack a formal name at present, but it is certainly not even close to our *D. teretifolium.*

AUSTRALASIAN *DENDROBIUM* HYBRIDS

With only ten species to work with in the *Dendrocoryne* Section, we may face a future where there is a "sameness" amongst hybrids. With the injection of species from Papua New Guinea and the regions of Fiji, Vanuatu, etc. (so they can conform to A.N.O.S. guidelines), we can further our horizons once again. There has been an increase in the interest and cultivation of orchid species from Papua New Guinea. We often read accounts and descriptions of these plants in back issues of *The Orchadian,* but hardly saw live specimens.

Many species have been imported as flasks or seedlings obtained throughout the country. On maturity many of these are pollinated to further perpetuate the species, so that they may also be used for hybrids. Some of the people responsible for this are Jack Jannese, Darryl Smedley, Phillip Spence, Geoff Stocker, Richard Warren, Ron Wheeldon and myself. We have started to explore the potential when the *Palaenanthe* and *Spatulata* Section species are used, but the Section *Latouria* has been barely touched. Some of the pioneering work was done by Kevin McFarlane, who produced *Dendrobium* Janice Kerr (*D. speciosum* X *D. tangerinum*), *D.* Our Native (*D. speciosum* X *D. johannis*, most probably *D. trilamellatum*), *D.* Australian Beauty (*D.* Meadie X *D. speciosum*) — not strictly Australasian and *D.* Ron Kerr (*D.* Fiftieth State X *D. tetragonum*) and Phillip Spence.

Phalaenanthe: We have already mentioned *D. bigibbum* and *D. affine* (syn. *D. dicuphum*). Papua New Guinea offers us the elegant, but sometimes difficult to grow, *D. williamsianum.* This lowland white with bluish purple lipped species may be used to create bi-coloured hybrids.

Spatulata: Some of the species available in collections as mature plants are *D. antennatum, D. canaliculatum, D. carronii, D. crispilinguum, D. discolor, D. gouldii, D. johannis, D. lasianthera, D. magistratus, D. nindii, D. stratiotes, D. tangerinum* and *D. trilamellatum. D. crispilinguum* and *D. magistratus* are highland plants from Papua New Guinea and could provide the breakthrough for hybrids tolerant of cooler conditions.

Latourea: It is this Section that I am most interested. Many of the species from Papua New Guinea come from the mid to high altitudes so require minimal heating in winter in temperate climates. (Some will grow in the bushhouse if you live near the coast).

There are miniature species (e.g., *D. aberrans* and *D. cruttwellii*), species with very large flowers (e.g., *D. engae, D. eximium* and *D. spectabile*), but what they all seem to have are long lived flowers — up to three months! I have only seen a few of the intersectional hybrids involving *Dendrocoryne* species or hybrids. One being *Dendrobium* Daddy Longlegs (*D. atroviolaceum* X *D. tetragonum*).

Phillip Spence has a number of *Latourea* X *Dendrocoryne*-style hybrids, many have not flowered to date. Some of these include:–

- *Dendrobium atroviolaceum* X *D. falcorostrum*
- *D. bifalce* X *D. falcorostrum*
- *D. bifalce* X *D. speciosum*
- *D. kauldorumii* X *D.* Star of Gold
- *D.* Ron Kerr X *D. falcorostrum*

I can see this style of hybrid being popular internationally.

Some of the *Latourea* dendrobiums available in Australia include: *Dendrobium aberrans, D. alexanderae, D. atroviolaceum, D. bifalce, D. convolutum, D. cruttwellii, D. engae, D. eximium, D. finisterrae, D. forbesii, D. phonsoniae, D. kauldorumii, D. macrophyllum* and *D. macrophyllum* var. *subvelutinum, D. otaguroanum, D. polysema, D. rhodostictum, D. spectabile, D. tapiniense* and *D. woodsii.*

OTHER SPECIES TO WATCH AND AVENUES WORTH EXPLORING

Maybe I am dreaming, but wouldn't it be fantastic if we could link some of the *Oxyglossum* Section (e.g., *Dendrobium cuthbertsonii, D. laevifolium* and *D. prasinum*) and/or *Calyptrochilus* Section (e.g., *Dendrobium lawesii*) to our Australian dendrobiums. Hybrids should be attempted with *D. tetragonum* for starters, as this species seems to hybridise readily with other Sections.

ACKNOWLEDGEMENTS

Whilst many of the slides shown were taken by the author, I wish to express my thanks to David Titmuss for providing me with literally hundreds of transparencies, being the result of photographing many of the plants in our (and other peoples') collection. Most importantly, I would like to thank the hundreds of people who have been of help to me throughout my orchid growing life from the age of five — particularly my father Graeme who has always encourage me. I was told many years ago that my "fad" for growing orchids would soon wear off. I guess I'm still waiting. ✻

THINK ON THIS

Orchids, like the species *Homo sapiens,* breathe; it is necessary therefore, to keep the leaves clean, particularly the underside, so this vital process can take place. Orchids obtain much of their nourioshment from the air; this is another reason to keep the leaves healthy and clean and functioning properly. ✻

GROWING HINT

If overwatering takes place when roots are imprisoned in a pot, the roots, having no reason to search for moisture, stay still, with the result they quickly exhaust the food supply in the vicinity of that small area of root. Without good drainage, excess moisture sours the growing media.

The roots consist of a spongy sheath with a slender central fibre. The function of the many layered spongy tissue is to quickly soak up moisture and hold it for use by the plant.

The roots of qpiphytic orchids in their natural state do not reach the ground, but mainly serve as a means of attachment; they frequently contain chlorophyl and perform in part the function of leaves. ✻

An Invitation to the

FOURTEENTH ANNUAL SPRING SHOW

of the

AUSTRALASIAN
NATIVE ORCHID SOCIETY
Central Coast Group

at the
Australian Springtime
Flora Festival
Mt. Penang, Kariong

on
Thursday **8th** – 9am-5pm
Friday **9th** – 9am-5pm
Saturday **10th** – 8am-5pm
Sunday **11th** – 8am-4pm
SEPTEMBER, 1994

★ **Orchids for sale**

Dendrobium aemulum
Common names
Ironbark Orchid
Box Tree Orchid
White Feather Orchid

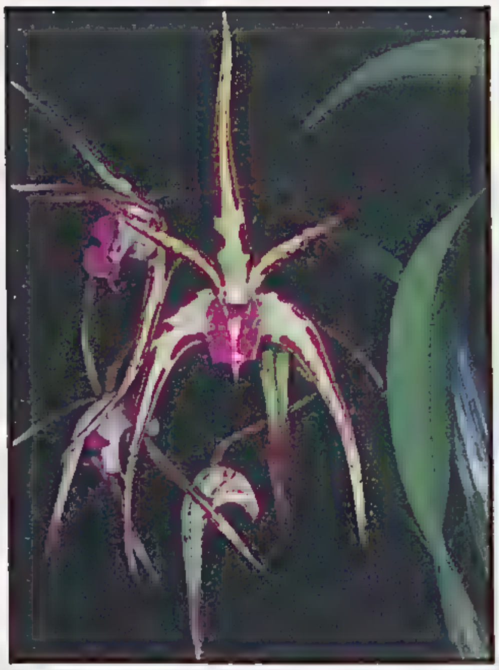

Plate 37: *Dendrobium* Regal Affair.

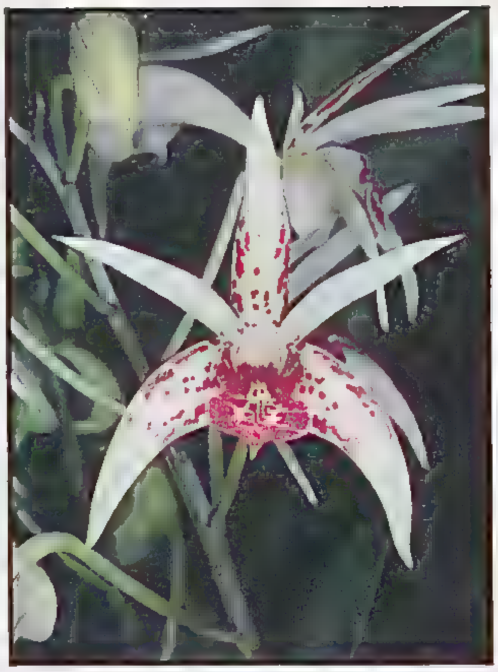

Plate 38: *D.* Warrambool 'Lipstick'.

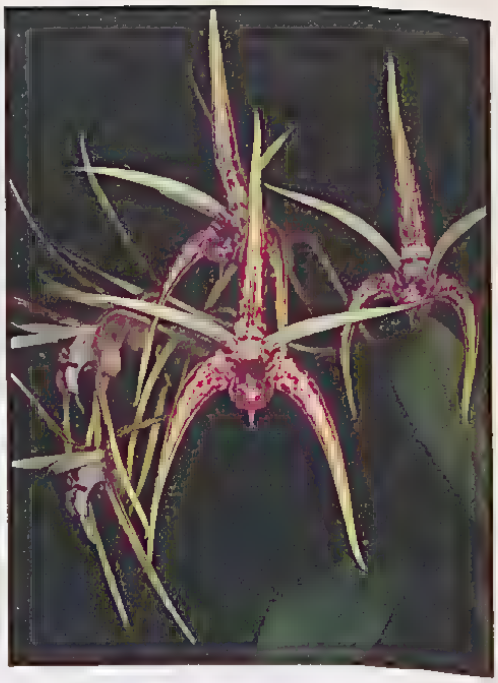

Plate 39: *D.* Warrior 'Goliath'.

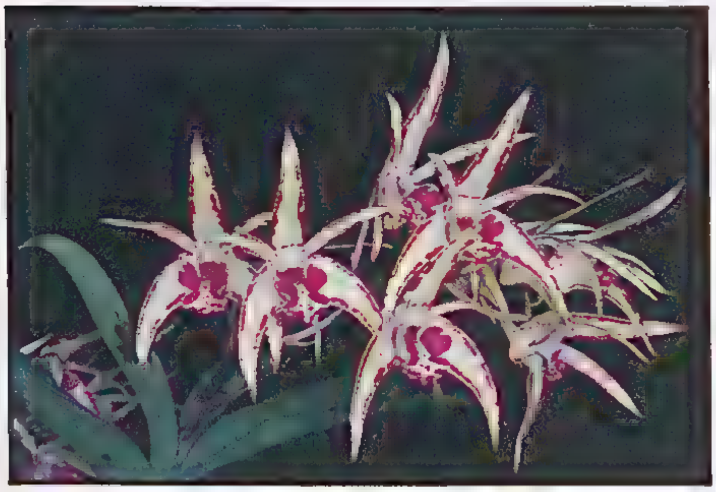

Plate 40: *D.* Warrambool 'Star Dust'.

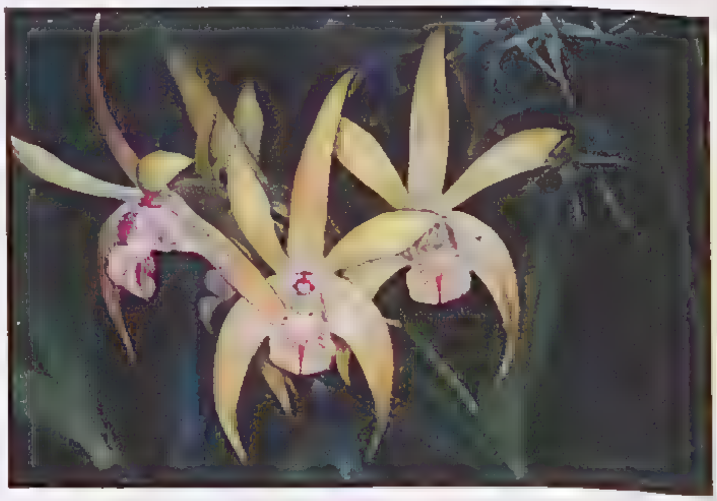

Plate 41: *D.* Brolga.

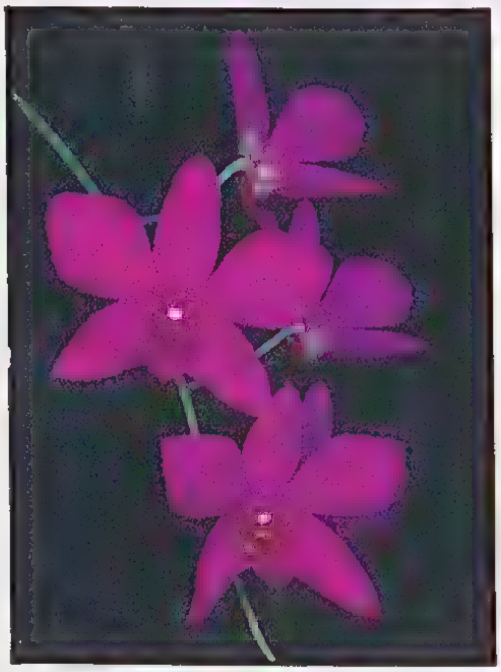

Plate 42: *D.* Colonial Maid.

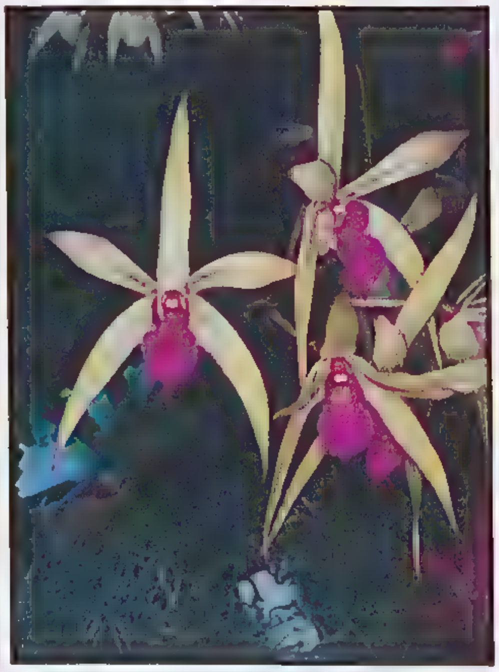

Plate 43: *D.* Elegant Heart 'Blue Tongue'.

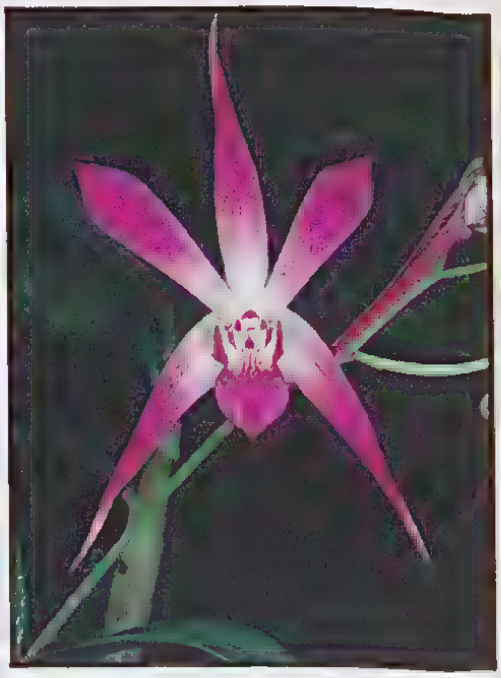

Plate 44: *D.* Rosella 'Red Giant'.

Photos by D. Banks.

AROUND THE GROUPS

NEW COUNCIL FORMED IN QUEENSLAND

Walter T. Upton

A.N.O.S. made a great step forward in May, 1994 by forming a Northern Regional Council.

I was privileged to attend the formation meeting that took place at the Walter Burnett Pavilion during the International Festival of Orchids Conference in Brisbane.

Those present were:–
Kabi Group — J. Hazelwood, J. Male
Logan Group — L. Barton
Mackay & Dist. Group — H. & L. Verroen
Wide Bay Group — G. Muller,
G. Bolderrow
Native Orchid Soc. of Queensland —
M. Bartlett, E. Thorogood
A.N.O.S. Gold Coast — I. Carson as observer
A.N.O.S. Council — W. T. Upton by invitation.

The Native Orchid Society of Toowoomba, the Atherton Group (in recess at present) and the Townsville Group had indicated they wished to be kept informed of developments, the latter two were in favour of a council being formed.

John Hazelwood chaired the meeting.

After much discussion it was agreed that an A.N.O.S. Council should be formed.

The naming of the council and the area it should cover was discussed at length. It was unanimously decided that a regional council rather than a state council was the way to go. The boundaries should be fluid to provide for Groups to affiliate across State borders and to allow for council perimeters to be altered to suit growing areas.

It was agreed that the council be named — "A.N.O.S. NORTHERN REGIONAL COUNCIL".

Office-bearers elected were:–

Chairman	John Hazelwood
Vice-Chairman	Lex Barton
Secretary	Jim Male
Treasurer	Harry Verroen

The Chairman stated that the main aim of the new council would be communication and co-ordination and it would have an immediate responsibility to take control of the judging Panel and to train more judges. It was not the council's role to interfere in the domestic affairs of a Group.

The meeting was a most friendly and informative affair and took place in an atmosphere of great enthusiasm. The A.N.O.S. NORTHERN REGIONAL COUNCIL is not in any way a breakaway from the current A.N.O.S. Council, at present situated in Sydney, or trying to take over that Council, but is part of an overall organisational improvement which has been under discussion for some considerable time by A.N.O.S. Council.

A.N.O.S. cannot stand still but must advance; it will take many years to fully realise the desired and envisaged organisation, so that we can truly be the "Guardians of our Native Orchids." ✾

ALICK DOCKRILL AT A.N.O.S. SYDNEY GROUP SPRING SHOW IN SEPTEMBER

On the evening of Saturday, 17th September, 1994, A.N.O.S. Sydney Group Inc. will be hosting a lecture by Alick Dockrill, at Baulkham Hills Community Centre, Windsor Road, Baulkham Hills (entry to carpark via Conie Avenue, off Seven Hills Road).

Alick Dockrill's standing as an authority on Australian native orchids is unsurpassed and with the recent release of the updated edition of his monumental work "Australian Indigenous Orchids", there will not be a better opportunity for enthusiasts and professionals alike to hear him speak.

Alick will speak on two topics, Australian Tropical Terrestrial Orchids and Australian *Sarcanthinae* Orchids, commencing at 7.30 p.m. The entry fee of $4.00 will include light refreshments during interval.

The A.N.O.S. Sydney Group Spring Show will be held over the same weekend, Saturday, 17th and Sunday, 18th September, at the same venue, Baulkham Hills Community Centre, each day from 9.00 a.m. to 5.00 p.m. Those attending the Dockrill lecture on the Saturday evening will be welcome to view the Show from 6.30 p.m. ✻

CENTRAL COAST GROUP

Our Annual General Meeting and election of Office-bearers was held on 20th April, 1994.

The following are the Executive Officers fro the ensuing year:–

President	Bruce Murray
Vice-Presidents	John Turner Allan Peck
Secretary	Wayne Hewitt PO Box 10, Erina, N.S.W. 2250
Treasurer	Gary Sweikert

Social Outing and Field Excursion

In March we staged a social outing to an area of Mangrove Creek. The main objective was to observe the damage to the orchid population as a result of the summer bushfires.

After settling in at our base, the heartiest of us took a stroll along the ridge to the north of the creek where we observed large numbers of *Dendrobium speciosum* and *D. linguiforme* had been completely burnt. The regeneration was amazing. Where plants of four or more pseudobulbs had been burnt three or more new ones had been established and were already 150mm in length. Likewise the *D. linguiforme,* also completely burnt, had regenerated but at a much slower rate. Sadly, young seedling plants of *D. speciosum* that we had observed on previous occasions had not survived. The *Liparis reflexa* which grew on sheltered rock ledges and in crevices had not been affected by the fires and were flourishing.

Other orchids which were observed in areas not affected by the fires were *Dendrobium aemulum, Plectorrhiza tridenta* and *Sarcochilus hillii.* In areas not affected by the fires *Dendrobium speciosum* and *D. linguiforme* were thriving.

No terrestrial orchids were sighted but these should be in abundance in the coming months and years.

Our outing this month will be to Gosford's Rumbalara Reserve where, some years ago our Group relocated some orchids saved from inundation by extensions to Mangrove Creek Dam.

Annual Spring Show

Our Group's Annual Spring Show this year will be held in conjunction with the Gosford Springtime Flora Festival at the Mount Penang Centre at Kariong. As usual all A.N.O.S. members are invited to exhibit. ✻

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LETTERS TO THE EDITOR

[Referring to Australasian Orchids Illustrated No. 13; Volume 11 No. 4]

. . . *Phaius pictus* T. E. Hunt is not endemic to Australia, I found herbarium material of it at Lae from Morobe Province in Papua New Guinea and Neville Howcroft has seen living material of it there too. I published the new record in the April, 1994 Australian Orchid Review.

P. Ormerod

The Editor,

I refer to the June, 1994 issue of *The Orchadian* listing of "New Registrations March/April, 1994."

I feel that the listing of *Dendrobium* Rex's Delight should be clarified as to whether it is an Australian or Australasian native hybrid.

John Mewburn (Troppo John's Nursery) wrote some time back on the Australian hybrids involving *D. phalaenopsis* parentage. One section deals with *D.* Dalvey, which has been made using both *D. phalaenopsis* and *D. bigibbum*. The former is the much superior parent and the projeny easily identified.

Both plants are sometimes judged on the bench together and the true Australian has very little chance.

Many years previously, also in *The Orchadian*, it was pointed out that *D.* Pauline 'Limberlost' involved *D. phalaenopsis* parentage and was therefore Australasian and again the *D. phalaenopsis* has been used in some crosses registered as *D.* X*superbiens*. The flowers of the progency of these hybrids compared to a "bigibbum" parented *D.* X*superbiens* are like chalk and cheese.

John Mewburn lists in his own catalogue a *D.* David Baver and specifies that the parentage is *D. phalaenopsis* 'Bicolour' X *D. johannis* 'Giganteum'. He also lists *D. bigibbum* 'Red Princess' X *D. johannis* 'Giganteum', but to avoid confusion, does not list it as *D.* David Baver, yet this is the true Australian native hybrid of that name.

Again the difference in the flowers of both progeny is dramatic and the true plant has no chance against the colour of the usurper.

"A Checklist of Australian Native orchid Hybrids" published by A.N.O.S. Council conveniently sweeps the problem under the mulch by stating: "*D. bigibbum* replaces the **synonym** *D. phalaenopsis*". Then makes a second bite based on "Clemesha reducing *D. phalaenopsis* to synonymy with *D. bigibbum* (*Orchadian* 6, 27 (1978).

That appears to invite hybridisers to remake all *D. bigibbum* registrations using the superior *D. phalaenopsis* or has that already happened and I am naive. Would that explain the difficulty of remaking *D.* Esme Poulton using *D. bigibbum* as a parent?

To return to the original question, is *D.* Rex's Delight an Australian native hybrid as registered or is it based on a *D.* David Baver made with *D. phalaenopsis*?

Perhaps A.N.O.S. Council or the Judging Panel could have a look at the overall situation before the questionable hybrid registrations get too far down the track.

Another worrying trend is the "Talking Point" comment giving the number of Australian native hybrids. This should read "number of registrations."

I am aware that the cost of registering these hybrids creates a problem, however I am sure that everyone has in their collection a plant label which states, (*D.* Thingamee X *D.* Whatsit) X (*D.*whatever X *D.* Heath Robinson).

Now if I want to cross the projeny of that with my *D.* Whatcha-callit, I will need a microfiche machine to produce the label and I will still have no chance of registering the new hybrid.

The multi-name label problem reminds me of the Taiwanese company specialising in miniaturisation and if business improves further they will have to look for smaller premises.

To add to the confusion, we have another new registration called *D.* 'Megan's Charm' with the parentage also being *D. johannis* X *D. bigibbum*. Perhaps the *D.* David Baver X *D. speciosum* is actually Megan's Charm X *D. speciosum*?

Perhaps some reader can come up with an idea to address these problems.

Reg Angus

[Ed.—I think Mr Angus missed the point of my Talking Point, I was talking about our present increased awareness of our native orchids, in any case we do have over 578 *Dendrobium* hybrids].

AUSTRALIAN NATIVE ORCHID HYBRID REGISTRATIONS

(New registrations from lists in *The Orchid Review*, May/June, 1994):–

Name	Parentage	Registered by
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Michael Derham	Arcadia X Melba	Florafest (M. Derham)

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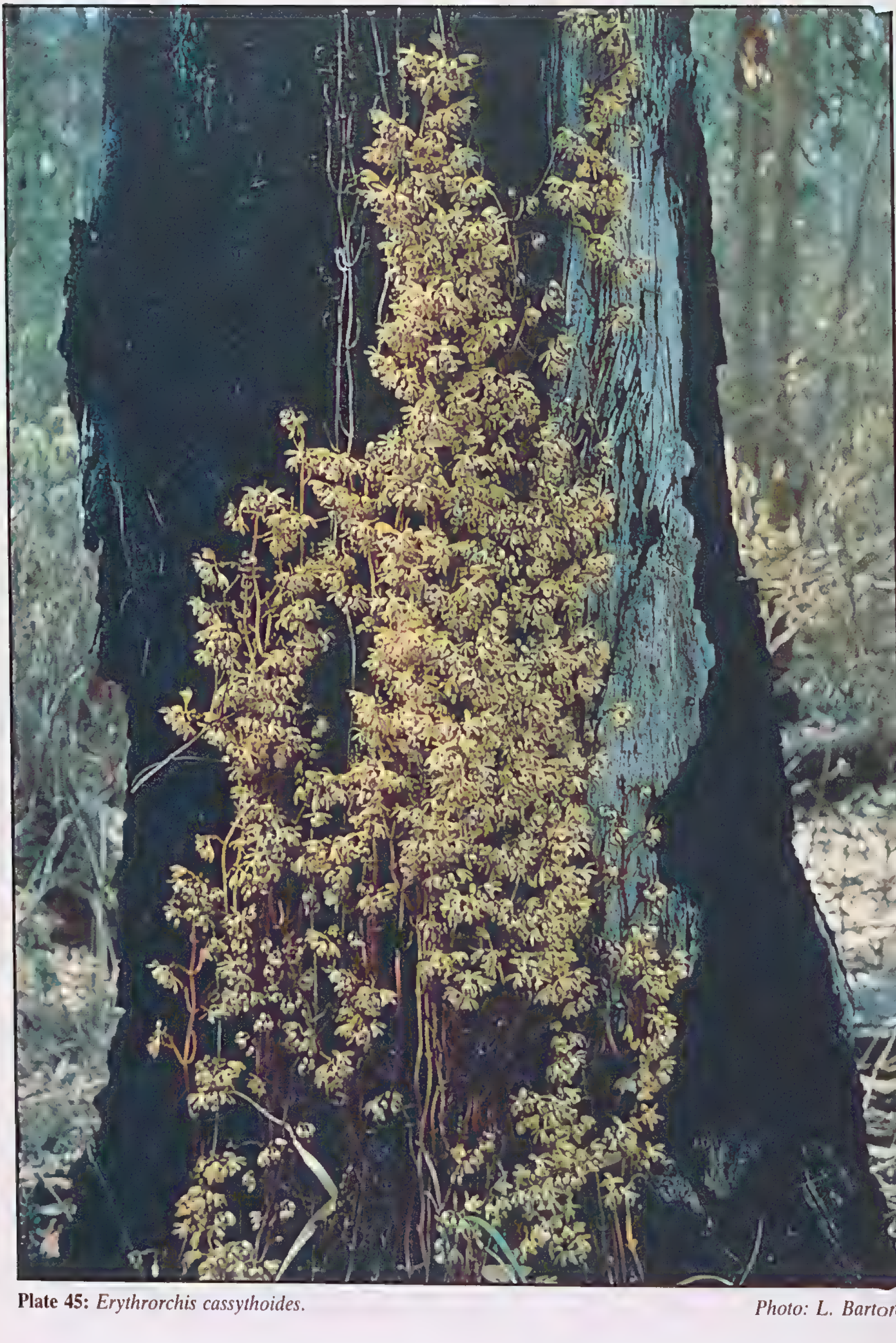

Plate 45: *Erythrorchis cassythoides.* *Photo: L. Barton*

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TALKING POINT

Much research of our native orchids is causing some problems with the acceptance or non-acceptance of the various name changes being proposed. To assist our readers to know which orchid is being written about, our future policy will be to quote both names that are being currently used. It is not our intention to insist upon a particular stand on which name to use, we will let the future decide that for us.

Our policy will be — if an author uses a name that has been in use for a long time we will accept that name in the article, but in brackets after it, we will insert the alternative name or new name. Conversely, if an author uses a new name, we will insert the old name in brackets after it, e.g. if the author uses the name *Dendrobium speciosum* var. *hillii* then in brackets after it we will insert (*D. tarberi*). If the author uses the name *D. tarberi* then we will insert in brackets the name (*D. speciosum* var. *hillii*) after it.

My wife and I recently travelled to Brisbane to attend the **Charity Festival of Australian Native Orchids** — Open Day and Show at Dayboro. This was a most pleasant and enjoyable social occasion and personified the great feeling that is achieved by a function such as this. Everyone lets their hair down and the stresses of daily life disappear, enabling us to rejuvenate our body and soul. We met new friends and renewed the old. There were enthusiasts from South Australia, Victoria and New South Wales as well as many from all our groups in Queensland. Congratulations to the organisers on a very successful occasion, 500 through the door by lunch time. (See Eric Wilde's report on page 263).

We now have two important events on our native orchid social calendar — Ken Russell's in Dungog, N.S.W. and now this one in Dayboro, Queensland.

Social events help to bring us all closer together, at the same time improving our knowledge of native orchids. Come on other groups, you can make this happen in your state too.

Walter T. Upton

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Best Wishes
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BREEDING COLD TOLERANT *DENDROBIUM BIGIBBUM*

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Over the past decade or so, more and more orchid growers have been discovering the new forms of *Dendrobium bigibbum* which can be easily grown and successfully flowered in most of coastal N.S.W. without artificial heating.

Not only will they grow and flower happily in unheated glasshouses, they will also perform well under bushhouse conditions, provided they are kept quite dry from May to September.

Most of these plants are due to the breeding efforts of Mr Ken Russell (K.W.R.) of Dungog.

This paper is mainly a record of his breeding programme, plus some comments on the plants used to produce these cold tolerant orchids, together with some generalised descriptions of some of the better known crosses.

The 'Cooktown Orchid' (the state flower of Queensland) is *D. bigibbum* var. *superbum* to most growers and botanists. However, *D. bigibbum* var. *bigibbum* is often grown under the same name, particularly as so many of the original 'Cookies' have been stripped from their native habitat and because the two flowers are so alike in size and other characteristics.

To growers in the southern states, both varieties are also very similar in their growing requirements. Although they may be grown in unheated glasshouses to about the latitude of Sydney, both are difficult to flower successfully that far south, as the buds often drop prior to opening in the first cool nights of autumn.

However, *D. bigibbum* var. *superbum* subvar. *compactum* (often known simply as *D. bigibbum* var. *compactum*), which comes from some altitude in the MacAlister Range, between Cairns and Mossman and little farther north, grows on rocks (i.e. a lithophyte), is much hardier and flowers somewhat earlier. As well as flowering earlier, its flowers seem much more cold hardy and it doesn't seem to suffer from bud drop, at least as far south as central N.S.W. on or near the coast.

Before dealing with the parentage of the new cold tolerant plants, it is worthwhile restating some of the material about the variability and occurrence of *D. bigibbum* (for more detail the interested reader is referred to Dockrill, Jones, Upton and Clemesha — see bibiliography).

Basically, *D. bigibbum* var. *bigibbum* is the most northern form, occurring on Cape York Peninsula north of the Archer River. *D. bigibbum* var. *superbum* then occurs from the Archer River southwards to Mt Molloy. Both these varieties are generally epiphytes growing on small trees or shrubs within one to six metres of the ground. Rarely they occur on rocks, but when they do the main numbers of plants are still epiphytes. According to D. Liddle (quoted in Clemesha, *The Orchadian* Vol. 6 p27–33), south of Laura the tendency to grow on rocks becomes more common and the plants become smaller, but they do not become as compact as true 'compactums', and Liddle showed, by determining a length/thickness ratio for their pseudobulbs, a clear distinction between these 'compact superbums' and subvariety *compactum*.

At Mt Molloy (the southern limit of *D. bigibbum* var. *superbum*) *D. bigibbum* var. *superbum* occurs (occurred?) as an epiphyte on low shrubs along the creek flats just west of the township. Frosts may occur here in winter and the plants are quite small, only about 20–30cm high. On Mt Molloy itself, at an altitude some 200m higher, the real 'compactums' occur, growing on rocky outcrops.

D. bigibbum var. *superbum* subvariety *compactum* has a restricted occurrence in the MacAlister Range and the first discovered locality was in the headwaters of Hartleys Creek. This is a small, fast flowing creek which drains straight into the ocean on the east side of the MacAlister Range. Probably, because of the proximity to the ocean, this 'compactum' grows larger than the more inland forms which inhabit harsher climates.

The newer kinds of *D. bigibbum* mentioned earlier, have been mainly distributed under K.W.R. cross numbers, for example, *D. bigibbum* 136 (KWR) or *D. bigibbum* var. *compactum* 136 (KWR) or often simply 'compactum 136' (Plate 5).

These plants are much more vigorous and easier to grow than any of the wild forms (including collected 'compactums') and clearly show hybrid vigour. They also grow larger than most collected 'compactum' forms and generally have larger and better shaped flowers.

Now that various other growers have started using these plants as parents, such seedlings as '136 selfed' or '617 selfed' or '136 x 617' etc. as well as hybrids of these with other species or hybrids, are appearing. Hence it seems advisable to try to put on record the background to these plants before their history is lost or the situation becomes too complicated.

At present, 'KWR 136' and 'KWR 617' are probably the most well-known and widely distributed of the Ken Russell's *D. bigibbum* crosses. 'KWR 136' is known as 'compactum 136' (as mentioned earlier) but an examination of the studbook kept by Ken has shown that it is not in fact a 'compactum' at all, but a second generation outcross of the Mt Molloy 'compact superbums'. It is usually labelled 'pale x album' and the album plant was a white selection from 'KWR 48' (see appendix). 'KWR 48' (Plate 2) itself was recorded as 'pale bigibbum (Mt Molloy) x bigibbum (Mt Molloy)' and a white (but not necessarily an albino) seedling was selected and backrossed to the same 'pale' plant as used originally to produce the 'KWR 136' line.

'KWR 136' is very easy to grow and probably already shows selection for vigour and adaptation to the central coastal N.S.W. climate. Flowers vary from pale pink to quite dark mauve and from the size of the original parents to about a third larger, up to 30mm across.

'KWR 617' (Plate 4) was produced by crossing a selected 'compactum' (c.v. 'Jellat No. 2') with a selected 'KWR 136' (c.v. 'Brando'). C.v. 'Jellat' was a name given to a cross between two selected 'compactums', one belonging to Ken Russell and the other to Noel Jupp. Noel Jupp made the cross and one of these was used to cross with 'KWR 136' 'Brando'. (The name Jellat records the name of the original north Queensland collector).

These 'KWR 617' plants seem to have thicker pseudobulbs than 'KWR 136' and also seem to be more vigorous. Their height is variable, from 'compactum' size to larger than the Mt Molloy 'compact superbum' types. In fact, they also seem to show hybrid vigour compared to their parents or the original wild plants.

The original 'KWR 617' plants were mainly light to dark mauve in colour and varied in size, but were generally larger than the 'Jellat' parent.

However, recent crossings and selfings (and backcrosses to 'KWR 136') have produced extremely variable plants. In colour they vary from white, through tinged white, very pale pink, pink and mauve to very deep mauve (Plates 3 & 7). They also vary very much in size and shape, with occasional very large flowers and some very full, with overlapping segments. One recently flowered seedling had 23 flowers on the inflorescence.

The author recently had the opportunity to view about 60 of these F2 plants, raised and flowered by Mr Vern Frampton on the N.S.W. Central Coast and the display was magnificent.

'KWR 617' has been used for further breeding, e.g. 'KWR 5–66' (new numbering system) = *D. bigibbum* c.v. 'Beauty' x c.v. 'Hank' (a selected 'KWR 617'), while 'KWR 702' = '136 c.v. KWR' x c.v. 'Beauty', and 'KWR 720' = c.v. 'Jellat No. 2' x c.v. 'Beauty'.

'KWR 411' has produced some of the best flowers so far seen. It includes such named cultivars as 'Beauty', 'Reefer' (Plate 1) and 'Raffles'. These plants are somewhat warmer growers than 'KWR 136' and 'KWR 617' as they include var. *bigibbum* and var. *superbum* in their ancestry, as well as the cool growers.

'KWR 411' is a cross between selected clones of 'KWR 53' and 'KWR 58'. The former (53) is a cross between a selected var. *bigibbum* and a 'compact superbum' (from Mt Molloy), while the latter (58) is a cross between a var. *superbum* from Font Hill and another selected var. *superbum*.

These plants only contain 25% of the cooler growing forms. Thus they are taller growers than 'KWR 136' and 'KWR 617' but they are considerably stouter than var. *bigibbum*. They are still very vigorous growers in this area and the named cultivars are beautiful flowers of quite large size. They are mainly in normal shades of mauve similar to the usual *D. bigibbum* colours, except that c.v. 'Reefer' was selected for its reddish overlay.

C.v. 'Reefer' has been used in further crosses as '411 Red'. This has been crossed with selected 'KWR 136' and 'KWR 617', etc., to produce further cooler growing plants. C.v. 'Beauty' has been used in a number of further crosses (see appendix).

In the 1994 Orchid Glen Show at Dungog, a plant of 'KWR 411' c.v. 'Raffles', grown by Gordon Young was judged Reserve Champion of the Show (Plate 6).

As well as the cool growing types, Ken Russell has made a number of crosses, such as 'KWR 109', 'KWR 139', etc., to produce better quality whites. As these have involved pale and white 'compact superbums' from Mt Molloy as well as typical var. *bigibbum* album and var. *superbum* album plants, they are cooler growing than normal white 'Cooktown Orchids'. Also there are now seedlings appearing such as '*D. bigibbum* compactum white x bigibbum white (KWR 139)' and '*D. bigibbum* superbum album x compactum white' (Pacific Orchids Catalogue, 1993) which should be cooler growing again. Obviously selfings and sibling crosses of these and other white crossings can be selected for even cooler growing characteristics.

GENERAL OBSERVATIONS ON PLANT FORM

White or mauve flowering plants involving typical var. *superbum* and var. *bigibbum* parents have tall, thin pseudobulbs identical with typical 'Cooktown Orchids'.

Plants like 'KWR 411' which have mainly typical var. *bigibbum* and var. *superbum* in their background, but which also contain 25% or so of 'compact superbum' or 'compactum' are generally 25% or so shorter and markedly stouter (at least twice the diameter of the typical varieties).

Plants like 'KWR 136' and 'KWR 617', etc., containing 50% or more of 'compactum' or 'compact superbum' in their parentage are much shorter (one third to one half the size) and three or four times thicker.

When these later, more complex crosses are selfed or sibling crossed, a wide range of pseudobulb sizes is produced, some quite dwarf to others quite tall. However, they almost never resemble the old 'Cooktowns' in appearance as they are always much thicker and at least a third shorter. Thus they always look a much stouter or more substantial plant.

FUTURE DIRECTIONS

It is very obvious, particularly from Vern Frampton's results, that there is a large potential for further and rapid improvement in cold tolerant hardcane dendrobiums based on these smaller growing forms of *D. bigibbum*. Selfing of top clones of 'KWR 136' and 'KWR 617' (or related crosses) can produce the full range of colours from white to deep purple, while also producing larger and better shaped flowers. Inflorescences with graceful arching habit and more than 15 flowers are easily achievable (one plant has already produced 23 on an inflorescence).

Selection for smaller growing plants, similar in size to the original 'compactums' but with much improved flowers and habit of inflorescence is definitely one line to be followed. A plant height of 10–15cm at maturity would produce ideal plants for indoor, home or office decoration.

Hybrids produced by crossing the most cold tolerant clones with warm growing hardcane dendrobiums of all types would be of great value to countries which need heated glasshouses to grow such plants, like Japan and the U.S.A. Together with the dwarf habit, such hybrids would achieve a very large saving in growing cost per plant.

As far as southern Australia is concerned, it would mean many hardcane dendrobium types could be grown much further south than at present without any artificial heating at all.

Such crosses would also greatly extend the flowering period in the south. At present these cold tolerant plants flower (roughly) from March to June or July. Crossed with spring flowerers, or modern hybrids with recurrent or continuous flowering, year round and recurrent blooming could be expected.

Similarly, cold tolerant hybrids involving indigenous species, flowering at any time of the year, offer huge potential for enlarging the range of hot/cold (so called at present) native crosses, whilst these hot/cold hybrids become even more cold tolerant.

The author of this article would be very interested in hearing about (and obtaining) any selected clones of natural occurring 'compactum' forms. Due to their near disappearance from the wild due to over-collection, it is important that the original plants be propagated and grown in cultivation and not lost or replaced by the improved strains.

In particular, unusual colour forms or outstanding clones should be saved from extinction. If any information is available as to the origin of the plants this should also be recorded.

APPENDIX 1

Abbreviations

compactum = *D. bigibbum* var. *superbum* sub var. *compactum*

superbum = *D. bigibbum* var. *superbum*

bigibbum = *D. bigibbum* var. *bigibbum*

compact superbum = compact (smaller growing) form of *D. bigibbum* var. *superbum* from Mt Molloy area — **not** subvariety *compactum*

Where dates are given they indicate date seeds were planted or cross was made.

APPENDIX 2

List of Parentages of KWR cross numbers

25	compactum (Black Mountain) x bigibbum (Limberlost Nursery) 1.5.1978
48	compact superbum (pale — Mt Molloy) x compact superbum (Mt Molloy)
53	bigibbum (Roy Ford) x compact superbum (dark — Mt Molloy) 2.6.1978
58	superbum x superbum (Font Hill)
60	compactum c.v. 'Blue Moon' (Limberlost Nursery) x compact superbum (pale — Mt Molloy)

86 compact superbum (blue lip — Mt Molloy) x compactum (Mossman Gorge) 12.10.1978

102 superbum x self (pale mauve — Coen) 26.10.1978

109 superbum (white — Princess Charlotte Bay) x compact superbum (white — Mt Molloy)

125 compactum (Black Mountain) x selected seedling from KWR25

128 selected white seedling from KWR48 x compact superbum (white — Mt Molloy) 1.5.1980

132 superbum (M. Peters) x compactum (dark — Mossman Gorge)

136 selected seedling from KWR48 (white) x compact superbum (pale — Mt Molloy)

139 superbum (white — Princess Charlotte Bay) x bigibbum (pale blue)

140 superbum x compact superbum (Mt Molloy)

167 compactum 'Jellat' (N. Jupp) x compact superbum (dark — Mt Molloy)

218 compact superbum (dark — Mt Molloy) x selected seedling from KWR53 (pale)

221 compactum (grey — Mossman Gorge) x self

223 selected seedling KWR167 x compactum (Black Mountain)

316 compact superbum (pale — Mt Molloy) x compact superbum (dark — Mt Molloy) 30.6.1984

406 selected seedling KWR136 x compactum (c.v. 'Jellat')

408 selected seedling KWR109 x superbum (white — seedling Cairns)

409 compactum (c.v. 'Jellat') x compact superbum (dark — Mt Molloy)

411 selected seedling KWR53 x selected seedling KWR58 1.5.1984

413 compact superbum (blue — Mt Molloy) x self

417 superbum (white — seedling Cairns) x bigibbum (white — Coen)

607 selected seedling from KWR136 (c.v. 'CB') x self

617 compactum (c.v. 'Jellat') x selected seedling from KWR136 (c.v. 'CB') 1.5.1986

698 c.v. 'Beauty' (selected seedling from KWR411) x selected seedling from KWR136 (c.v. 'KWR')

702 selected seedling from KWR136 (c.v. 'KWR') x c.v. 'Beauty' (see 698)

720 compactum (c.v. 'Jellat No. 2') x c.v. 'Beauty' (see 698) 14.6.1987

721 c.v. 'Beauty' x compactum (c.v. 'Jellat No. 2') — reverse of 720

737 bigibbum c.v. 'Splash' x c.v. 'Beauty' (see 698)

5–66 c.v. 'Beauty' (see 698) x selected seedling from KWR617 (c.v. 'Hank') 1.5.1989

5–67 136 (c.v. 'KWR') x self

5–179 selected seedling from KWR702 x 136 (c.v. 'KWR') 10.5.1991

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EDITORIAL NOTE

The taxonomic classification of *D. bigibbum* Lindl. in Australia is at present controversial. Some botanists consider *D. bigibbum* to be a complex species consisting of several varieties (and/or subspecies), whilst others are of the opinion that these taxa represent separate species. These two viewpoints, relative to one another, are broadly as follows:–

Conventional Classification		**"New" Classification**
D. bigibbum var. *bigibbum*	=	*D. bigibuum*
D. bigibbum var. *superbum*	=	*D. phalaenopsis*
D. bigibbum var. *compactum* (or var. *superbum* subvar. *compactum*)	=	*D. lithacola*

KEN RUSSELL'S *DENDROBIUM BIGIBBUM* CREATIONS

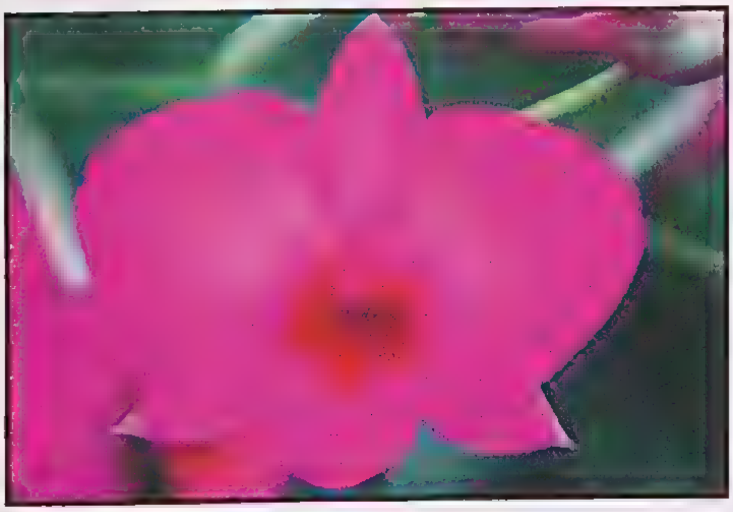

Plate 1: 'KWR 411 Reefer'

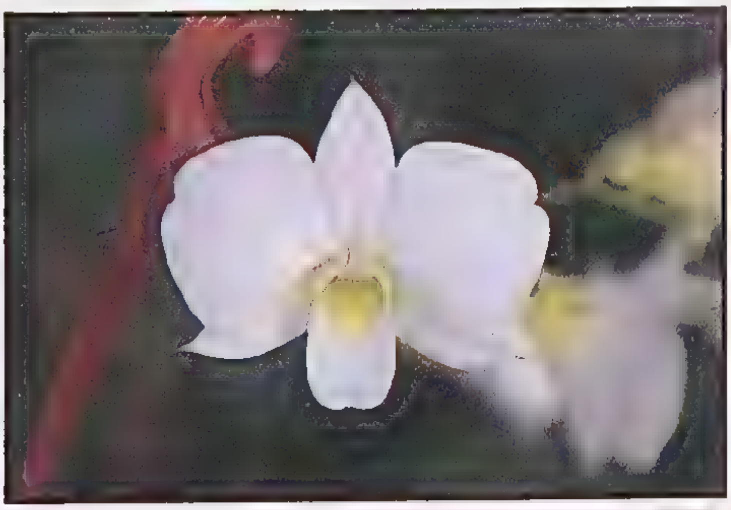

Plate 2: 'KWR 48'

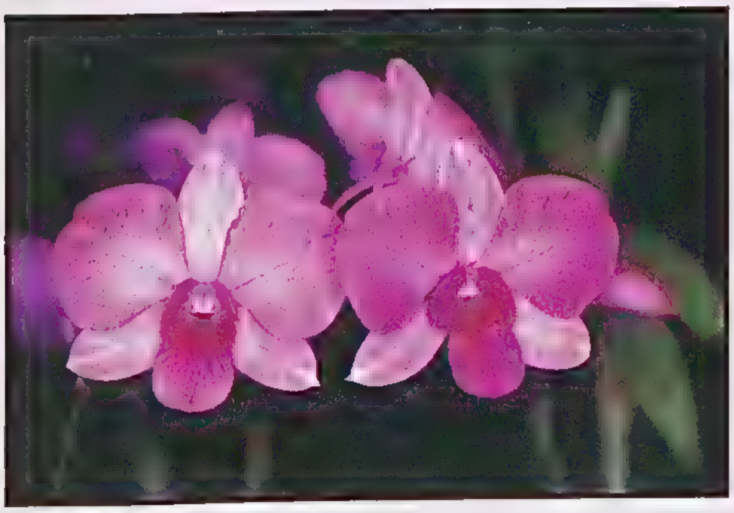

Plate 3: 'Jellat' x 'KWR 136'

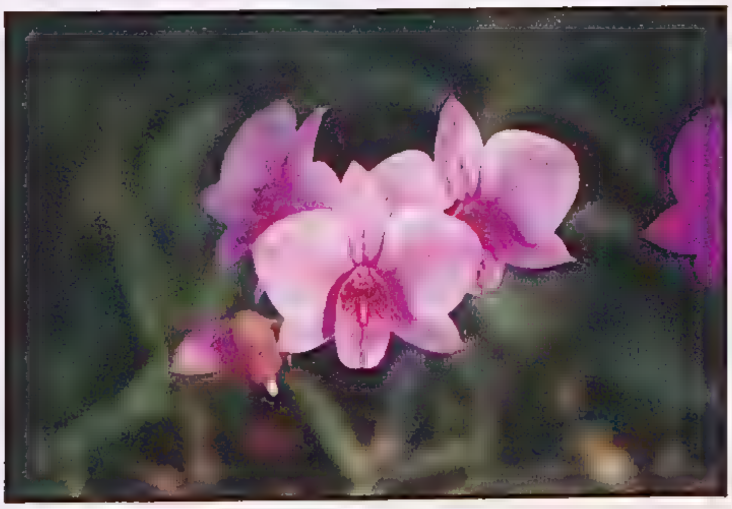

Plate 4: 'KWR 617'

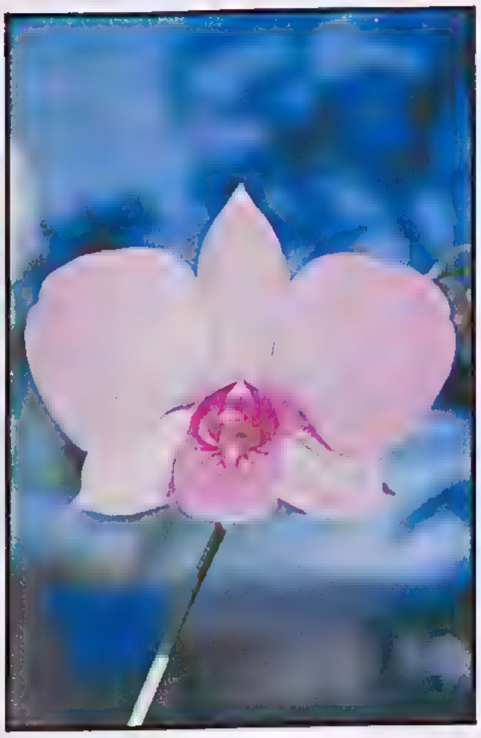

Plate 5: 'KWR 136'

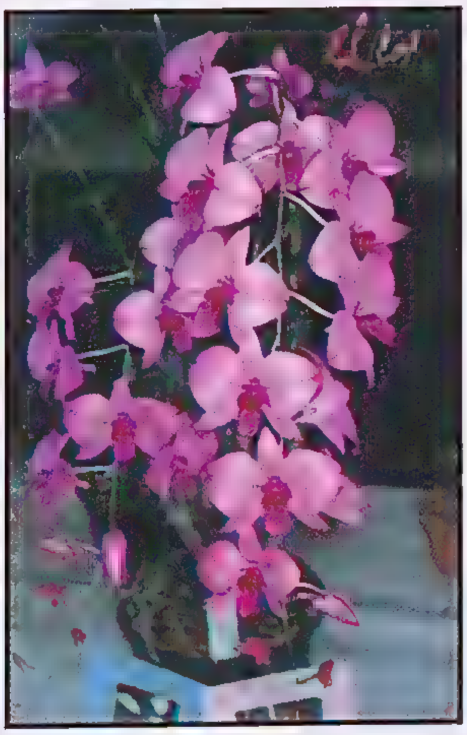

Plate 6: 'KWR 411 Raffles'

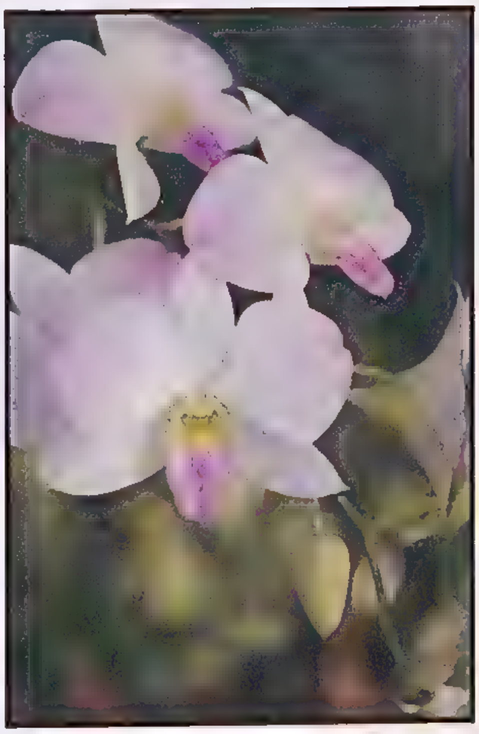

Plate 7: 'KWR 617' x 'KWR 136'

Photos by K. W. Russell.

The following article is a modified version of lecture notes which accompanied a lesson on the judging of native hybrids delivered to the current A.N.O.S. Judging School in June, 1994.

JUDGING COOL-GROWING AUSTRALIAN NATIVE DENDROBIUM HYBRIDS

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In order to effectively judge species orchids, judges must be familiar with each species and learn to assess what is good, average and poor based on their knowledge and experience of each species. We know what to expect as far as the boundaries for each species are concerned and we judge each species against itself, so to speak — that is, against the imagined optimum for the species being judged. We would say, for example, that this is a good *Dendrobium speciosum* for what it is, a *D. speciosum*, based on our knowledge of what we have seen of *D. speciosum* over the years, on the showbench, in collections and in the wild. In fact, what judges must do is to decide where each plant falls within its own species on a percentage basis, i.e., in the top 10%, the bottom 20%, or wherever — and the plant that is the closest to the imagined optimum for its species will be the winner. To be able to achieve this, judges must know what each species is capable of producing.

When judging hybrids, however, a different judging philosophy is applied. There is no imagined optimum and each plant is judged directly against its competitors, one against the other, regardless of the hybrid-style or parentage. It doesn't really matter what they are, from a judging viewpoint and you could just as effectively judge a benchful of *Dendrobium* Unknown. We are now well past the stage of having to judge mostly primary hybrids, where we can assess them in relation to their parent species and decide whether or not they are an improvement upon their parents, so we must simply judge all native hybrids as they stand and how they rate against each other when the A.N.O.S. Judging Standards are applied. In essence, the judging of native hybrids is a simple comparative process.

There are presently something approaching 700 registered Australian native orchid hybrids and a significant number are quite complex hybrids with four or more generations of breeding. Native orchid hybridists have tended to use a fairly wide range of parent species, with a resulting wide range of shapes, colours and sizes in the hybrid progeny. As judges of these orchids, we accept and appreciate this diversity of hybrid styles.

The term "hybrid styles" is a loosely applied expression used to describe the various shapes (and, to a lesser extent, colours and sizes) of cool-growing Australian native orchid hybrids. This is not a precise term, of course and there are many intermediates from one end of the scale to the other; from tall, spidery-shaped flowers (the so-called *D. tetragonum*-shape), through to smaller, more or less round-shaped flowers (the so-called *D. kingianum*-shape). Regardless of how well rounded a hybrid flower may be, the breeder has only to cross it with a spidery type to lose that rounded shape in the next generation. With exotic hybrids, large, round flowers have been the result of many generations of breeding, often within just a few primary species. But even with these, breeders will often go back to the species in order to introduce some characteristic they believe will benefit their work, such as plant vigour, new shapes and/or colours, etc. . . . With Australian native orchids, breeders have not gone down the path of attempting to produce "dinner-plate" hybrids, but instead have bred across virtually the entire range of species, in order to reflect and enhance the distinctive shapes of our native orchids. The relatively recent introduction of several tropical species to cool-growing hybrid *Dendrobium* lines, has extended the range of shapes and colours considerably and these "hot/cold" crosses are currently very popular with growers.

The A.N.O.S. Judging Standards, as set out in the A.N.O.S. Judging Handbook, are the precise method by which A.N.O.S. Judges qualitatively assess native orchids. They consist of marks out of a possible 100 and include descriptive passages defining what the judges should look for in each of the judging categories of: SHAPE (25 points), COLOUR (20 points), SIZE (15 points), TEXTURE (10 points), HABIT OF INFLORESCENCE (15 points) and FLORIFEROUSNESS (15 points).

Judges must learn to suppress their own subjective preferences and opinions in order to assess plants competently and fairly. In the categories of Size, Texture, Habit of Inflorescence and Floriferousness, personal preference does not come into play to any great extent, for these characters are more or less absolutes. The assessment of these categories is generally straight forward with no great diversity of opinion. However, with Shape and Colour, subjective opinions may, on occasions, influence judging outcomes. To overcome this eventuality, judges must keep in mind that they are not judging Shape as an absolute, they are judging the quality of the shape. Likewise, judges do not judge colour, as such, but the quality of the colour.

SHAPE — 25 POINTS

Proportion and symmetry are two key words judges use when assessing hybrid shape. Good shape is not dependent upon wide floral segments (i.e., the wider the segments, the better the shape, leading to the logical conclusion that all flowers should be round with overlapping segments). Bear in mind the various hybrid styles we see in native hybrids and the concept that all basic shapes are equally acceptable as long as proportion and symmetry are present.

Judges look for vertical symmetry and horizontal proportion or balance. Vertical symmetry means that if an imaginary line is drawn down the centre of the flower, from top to bottom, then the flower would be perfectly divided into two, with each side a mirror image of the other.

By horizontal proportion, we mean that the top half of the flower is more or less balanced by the bottom half, as far as both the mass and the overall dimensions of the flower are concerned. This varies somewhat according to the hybrid-style, but balance between the shape, length, position and mass of the segments should be maintained nevertheless.

The labellum is the focal point of the flower and it should be veritcally central. With the more star-shaped hybrid styles, the labellum will be more or less horizontally central as well, but as the overall flower shape tends towards round, the labellum generally drops to the bottom half of the flower and it may even protrude downwards to be the bottom-most portion of the flower in some cases. Whatever its position, the lip should be in balance and symmetry to the remainder of the flower. The lip should be generous in proportion to the overall size of the flower, for few features detract more than a labellum that is too small. A good rule of thumb is to think of the lip as a third petal, which, of course, is exactly what it is. In mass, it should be no less than equal to each of the other two petals; it will certainly be a different shape to the lateral petals, but in bulk it should be about the same, or even larger in some hybrids.

The labellum should be open, with the mid-lobe more or less flat. In some hybrids the mid-lobe may jut forwards, whilst in others it may turn downwards, but as long as it is flat or nearly flat and it is well displayed, it will compliment the flower. In some hybrids the side-lobes of the labellum are also turned outwards, to create a very attractive effect.

Common problems with SHAPE are as follows:–

- — flowers not properly open at time of judging (this is often seen, as exhibitors bring in plants which are not yet at their best; or in the case of many of the *D. speciosum* hybrids, the flowers have closed up again by the time judging is being carried out)
- — flowers too cuppy or clawy (in many hybrids the flowers just do not open flat enough; in round-shaped hybrids we say they are too cuppy, whereas with intermediate and starry-shaped hybrids they are said to be too clawy).
- — asymmetry
  - – dorsal sepal tilted; not straight
  - – lateral petals not equal in size or position
  - – lateral sepals unequal in size or position
  - – dorsal sepal asymmetrial in shape
  - – asymmetry of labellum
- — twisting of segments (esp. the more starry *D. tetragonum*-types, which may have twists in the dorsal sepal and/or the lateral sepals)
- — crossing or bowing of the lateral sepals (so-called "bow-legged" appearance, again esp. in starry-shaped hybrids)
- — kinking of segments; sharp bends, particularly on lateral sepals (*D.* Sunglow hybrids often have this fault)
- — lack of proportion of lateral sepals (the so-called "heavy-hips" appearance, where the proximal portions of the lateral sepals are disproportionately wide and then taper too quickly and also turn inwards)
- — irregular faults on margins of the segments
- — pinching at the base of the dorsal sepal
- — defects in lateral petals (as seen in some of the hot/cold crosses)
- — reflexing of segments, esp. upper segments (some reflexing may look attractive, but over-reflexed segments destroy good shape)
- — lateral petals not opening into the same plane as the sepals (the so-called "horned" appearance of the lateral petals, where they stick forward rather than opening out)
- — poor lip shape; pinched or closed in; lip disproportionately small in relation to the rest of the flower.

When the judge has identified shape problems, then a decision must be made about how many points are to be deducted — this will depend upon the degree of the fault(s) and how much the faults detract from the overall effect.

COLOUR — 20 POINTS

Again, personal preference for certain colours and colour combinations may come into play during judging. But, to minimise the efects of any such bias, judges must remember that they are not judging colour as such, but quality of colour.

Judges are looking for:–

- — clarity of colour
- — depth or strength of colour (not necessarily darkness of colour — even lighter colours can have depth and strength)
- — good definition of colour
- — evenness of colour across the face of the flower
- — pleasing colour combinations and evenness of colour combinations across the face of the flower (i.e., symmetry of colour distribution)
- — lustrous, fresh colour

Some colours are flat, whilst others are lustrous to the point of shininess (like they have been enamelled). Others are crystalline in appearance with bright points of reflective light.

There are clear colours, mottled colours, spotted flowers, brightly coloured lips, even partially striped flowers are appearing. Some of the "newer" colours are: ice green, burnt orange, purple/claret tones, soft pastels, autumn tones, golden yellows.

Colour is very important and you can see from the standard that credit will be given for unusual or striking colours. Awards of Distinction are often given for colour, especially for newer colours as they appear, or for unusual colour combinations. The hot/cold crosses are having a significant effect in this area.

Common COLOUR problems are as follows:–

- blurred colour; colour not well defined (this often happens where you have one colour overlaying another base colour, resulting in a blurred effect)
- dirty colour (again, this tends to happen where there is mixing of colours esp. in the yellows and autumn tones)
- faded colour (the colour in some flowers fades as the flower ages, esp. pinks and purples, so be careful to look at the older flowers — also be aware that some flowers have a faded look even when they are fresh)
- colour fading at bases or edges of segments
- blotched colour, where it is apparent that colour is stronger and then weaker across the face of the flower
- asymmetry of colour distribution (this occurs where darker markings are not evenly distributed across the face of the flower, or there is variation from one flower to the next).

SIZE — 15 POINTS

This is probably the easiest category to assess, with subjective preferences rarely encountered. We assess size on a comparative basis, in the sense that our experience in seeing a range of orchid flowers over a period of time leads us to say whether a flower is large, medium or small, based on accumulated knowledge.

Indeed, it would be quite possible to introduce an absolute system whereby points would be allocated on a measurement of size (e.g., a 100mm tall flower would get 100% of the marks available, down to a 10mm flower getting 10%). However, this is not our system and points must be allocated based on experience of size.

The main thing judges must keep in mind is that SIZE is worth just 15 points out of a possible 100 points and this must be kept in perspective. Too often we hear the comment "look at that one over there, it's a beauty", simply because of the size of the flowers, or someone will say "its only got small flowers" and dismiss an exhibit based on size alone. Remember, SIZE is only 15% of the marks and once that category has been judged, flower size should not influence the points allotted for other categories.

The other thing to look for in SIZE is consistency in flower size along the inflorescence. Certain types have large flowers nearer the bottom of the inflorescence and then flower size decreases along the rachis. This is a fault and it should be penalised.

SUBSTANCE AND TEXTURE — 10 POINTS

These are two different but related characters.

Substance relates to the condition of the flower and the strength of the segments, in the sense that as a flower ages it tends to lose substance and become either papery or soft and floppy. These faults become more obvious the more the flowers age, to the point where a plant is beyond showbench condition. It should be noted that poor substance is not necessarily due to ageing; some flowers have poor substance (i.e., papery or weak) even when they are fresh. Good substance is often described as "thick and waxy".

Texture relates to the surface structure and appearance of the segments. Some surfaces are sparkling and crystalline, whilst others have depth and a lovely reflective quality. These are desirable features. Poor features are flat texture with no sense of depth, rough or papery texture and irregular or uneven texture.

It is in this category that points should be deducted for blemishes on the flowers, caused either by ageing or by small fungal infections in particular.

From time to time judges will see exhibited plants on which many of the flowers are badly aged to the point where they are practically worthless from a judging viewpoint. Where this occurs, judges must decide that any such flowers are beyond judging and should not be considered. Such a decision will have an effect on FLORIFEROUSNESS, because flowers so eliminated will reduce points available in that category, even though they may still be physically present on the plant.

HABIT OF INFLORESCENCE — 15 POINTS

Habit of Inflorescence is an underrated character and often the difference between a good clone and an excellent clone is the manner in which the flowers are displayed. Habit of Inflorescence can be determined to a certain extent by good growing and grooming and it may also be variable on any particular plant from one season to the next.

Rightly or wrongly, a poor habit of inflorescence may result in a plant being overlooked or informally disqualified, because the flowers are not able to be easily assessed. The general rule is that if the judge has to pick up the inflorescence and turn the flowers up to see them, then the exhibit should be bypassed. Regardless of the quality of the flowers, if they cannot be seen properly then the plant will be severely penalised. Likewise, a good habit of inflorescence may enhance a plant's chances beyond the allotted 15%. When you really analyse why a particular plant won, you will often find it was the habit of inflorescence that brought it to the fore.

The Habit of Inforescence means NOT whether the inflorescence is erect, arching or pendulous (all of these are equally acceptable), but whether the flowers are well displayed on the inflorescence. Flowers should be evenly spaced, not bunchy, but also not too sparse. They should be upright, not tilted to one side or the other. They should face outwards and gently upwards. The orientation of the flowers in rows is considered an advantage.

The other aspect of Habit of Inflorescence is the manner in which the inflorescences are positioned on the plant as a whole. Ideally, they should be evenly distributed over the plant and should be positioned so that they compliment each other and the exhibit as a whole. They should not be crowded or bunched.

FLORIFEROUSNESS — 15 POINTS

There are two parts to the assessment of Floriferousness:–

(a) number of flowers (on average) per inflorescence

(b) number of inflorescences on the plant.

These two characters are assessed separately with 7½ points allocated to each.

(a) The Standard does not require any minimum number of flowers per inflorescence, although it should be kept in mind that if there are too few open flowers, or too few flowers in good condition, then a plant may be considered to be not in showbench condition. Judges need to be flexible in this area, however and not be in too much of a hurry to disqualify plants in such condition. We often hear the expressions that such and such a plant is "past its best" or "it will be better in a week" and although judges must draw the line somewhere about the eligibility of such plants, they must not be too rigid.

There are no precise rules about this and judges must use their judgement and decide on the day. It may be that a plant with only one or two open flowers will win a section because of the poorer quality of other plants on the bench, but judges must take into consideration the low level of floriferousness and award low marks accordingly in this category. At some point, however, a judge must decide that, regardless of how good a flower looks in comparison to its opposition, the plant is either not advanced enough or is too far gone to be eligible for judging.

As was mentioned when discussing the SIZE category, it would be possible to introduce a precise system of points allocated to number of flowers per inflorescence, with, say, maximum points at 15+ flowers (with 7½ points available as the maximum, this would equate to half a mark per open flower). However, such a system of assessment would not allow judges to use discretion in this matter.

When assessing FLORIFEROUSNESS, judges draw on their experience to determine whether a particular plant is carrying an average, above average or below average number of flowers, based on what they have seen over the years.

Often there is a trade-off between size of flowers and number of flowers per inflorescence and these characters should be reflected in the points allocated.

(b) Number of inflorescences per plant should be commensurate with the size of the plant; again, another matter for judgement, based on experience. To gain maximum or close to maximum points (i.e., 7½ points) here, a plant should carry more or less the maximum number of inflorescences that it could reasonably be expected to carry for its overall size and bulk. Conversely, points allocated will drop to practically zero if there is only one inflorescence on a large plant.

These notes were prepared in relation to the judging of cool-growing Australian native *Dendrobium* hybrids. However, many of the principles outlined and comments made are equally applicable to the judging of other types of native orchids, both species and hybrids, according to the A.N.O.S. Judging Standards. ✱

POLLINATION OF *BULBOPHYLLUM MACPHERSONII* RUPP BY A MIDGE FLY *(FORCIPOMYIA SAUTERI)*

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ABSTRACT

The pollination of *Bulbophyllum macphersonii* was examined in north-east Queensland. The flowers have a tremulous labellum and attract a midge fly pollinator. *Forcipomyia (Euprojoannisia) sauteri* removed the pollinarium as the insect reverses out of a flower. Pollination was achieved when a fly with pollinarium attached to its scutum brushed across the stigma, smearing pollinia over the surface, as it visited a second flower.

INTRODUCTION

The genus *Bulbophyllum* Thouars. includes over 900 species of epiphytic orchid (Dockrill 1969) and about 26 species are endemic to Australia (Jones 1988). *Bulbophyllum macphersonii* Rupp grows on boulders and trees above 500m between the Fitzroy and Endeavour Rivers in north-east Queensland (Dockrill 1969) and in coastal mangroves on Woodlark Island, Papua New Guinea (Howcroft 1993).

A number of *Bulbophyllum* species are thought to use fragrance, nectar or tremulous perianth parts to attract fly pollinators (van der Pijl and Dodson 1966, Dressler 1981, Jones and Gray 1976). Adams (1988) found that *B. macphersonii* was outbreeding, although the pollination system has not been described. The aim of this study was to describe the pollination system of *B. macphersonii*.

METHODS

This study was conducted between January, 1990 and July, 1993 at a site supporting large numbers of both epiphytic and lithophytic *B. macphersonii* plants. The study site was near the Walsh River, about 10km north of Herberton on the Atherton Tableland (17°25.5'S, 145°24.5'E, 1,200m). The vegetation at the site was a mosaic cover of Type 14a Tall Open Forest, Type 13c Vine Forest and Type 9 Rainforest (Tracey 1982).

Twenty-two plants of *B. macphersonii* were located, growing on six boulders and four trees and examined at regular intervals. Flowers were dissected and examined for the presence of fragrance, nectaries and nectar. Observations of pollinators were made between 0900 and 1700 hours during most climatic conditions. Pollinators were observed whenever possible, captured with an aspirator and samples were sent away for identification. Samples have been deposited with the Australian National Insect Collection, C.S.I.R.O., Canberra.

RESULTS

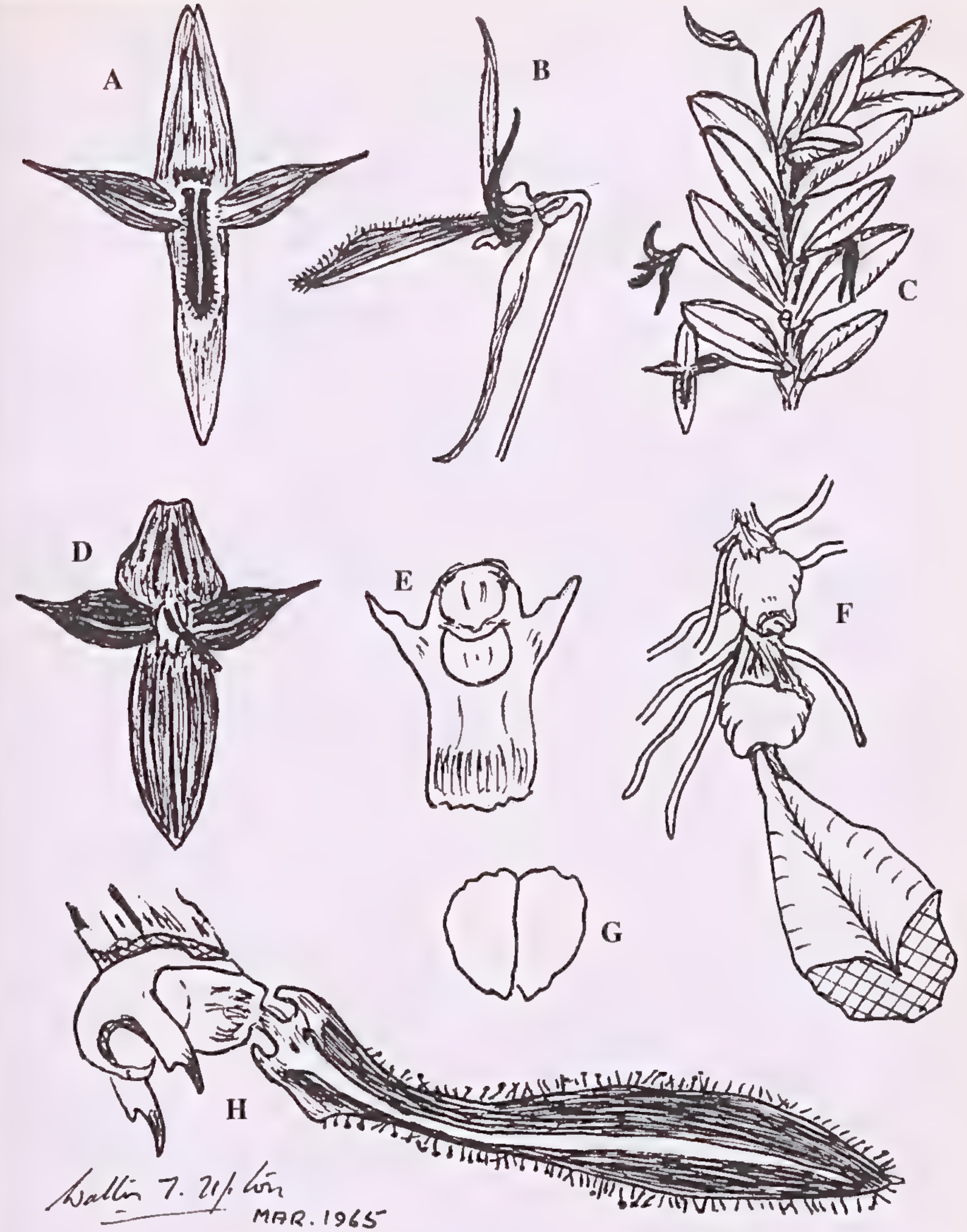
Flowering of *B. macphersonii* was sporadic throughout the year. Unpollinated flowers usually remain open for about 10 days following anthesis. The flowers are borne singly on short stems. They are non-resupinate, widely opening and deep red in colour. No obvious fragrance, nectaries or nectar was detected. The labellum is hinged by a narrow, springy claw and is tremulous in the wind. It is narrow-oblong in shape with slender cilia along the margin. Cilia on the narrow basal part are slightly shorter than the others. The column is at an angle of about 90° to the labellum. The pollinarium includes a closely appressed pair of pollinaria, without caudicles or stipes and each pair are equal or nearly so in size. The pollinarium is semi-ovoid in shape when viewed from above.

Over three years, the midge fly species *Forcipomyia (Euprojoannisia) sauteri* Kieffer (Diptera: Ceratopogonidae) was observed pollinating the flowers of both epiphytic and lithophytic *Bulbophyllum macphersonii* plants. Pollinator activity was found to occur between 0900 and 1400 hour when the temperature was above 20°C. *Forcipomyia sauteri* often hover around the open flowers *Bulbophyllum macphersonii* in small groups and up to three insects were recorded visiting a single flower.

Forcipomyia sauteri approached a flowering plant by a hovering behaviour and most approaches resulted in the insect landing on an open flower. A fly probed the upper and lower surfaces of the labellum near the apex and slowly moved into a flower. When entering from the lower surface its scutum protrudes into the stigma.

A fly spends five to 10 minutes searching for floral rewards and struggles to exit the flower. After numerous trials the insect reverses and wriggles to free itself. As *F. sauteri* reverses out of a flower its scutum comes into close contact with the column and anther and the pollinarium adheres to the insects scutum. The entire pollinarium was attached to the surface between the wings and did not appear to interfere with the subsequent flight of the insect.

A *F. sauteri* with a pollinarium attached to its scutum randomly moves to another flower on the same or another plant and slowly enters a flower on the lower surface of the labellum. In this position the scutum with the pollinarium attached forms a close fit with the surrounding column and stigma. The insect repeats the foraging behaviour on a second flower and pollinia were observed deposited on the stigma. A new pollinarium became attached to the same pollen vector as it reversed out of a previously unvisited flower. These insects



Bulbophyllum macphersonii Rupp

A.	Flower front view	4X
B.	Flower side view	4X
C.	Plant	1½X
D.	Flower front view	4X
E.	Column from front with column wings opened out	18X
F.	Pseudobulbs and cross section of leaf	6X
G.	Pollinia	approx. 30X
H.	Column and labellum	18X

visited several open flowers whilst slowly moving within and between plants.

DISCUSSION

Observations in this study are in accordance with the previous reports of myophily in the genus *Bulbophyllum* (van der Pijl and Dodson 1966, Dressler 1981, Jones and Gray 1976). At the study site, *B. macphersonii* was pollinated by the midge fly. Pollinarium removal occurred when the scutum of *Forcipomyia sauteri* contacted the stigma and pollinarium as it reverses out of a flower. Pollination was achieved when a fly carrying pollinarium on its scutum brushed across the stigma, smearing pollinia over the surface, as it searched for floral rewards. These processes were facilitated by the narrow gap between the column and labellum which brings the insect's scutum into close contact with the pollinarium and stigma. The floral structure in turn ensures the precise placement of pollinaria on the scutum of the midge fly species and indicates a high degree of adaptation to insect pollination.

Flies are one of the largest group of anthophiles (Armstrong 1979, Faegri and van der Pijl 1979) and the species of *Forcipomyia* are known to be important pollinators of commercial crops such as cacao and possibly avocado and rubber (Debenham and Wirth 1984). *F. sauteri* is distributed throughout coastal and upland habitats in Irian Jaya, Papua New Guinea, north and eastern Australia south to Sydney, Solomon Islands and Fiji (Debenham and Wirth 1984). Consequently, this species could pollinate the plants of *Bulbophyllum macphersonii* throughout its distribution.

B. longiflorum Thouars. attracts a fly pollinator with nectar (Jones and Gray 1976) and Jones (1988) reported the presence of gland-tipped cilia on the labellum of *B. macphersonii* which may have a role in attracting pollinators. The question remain as to whether cilia on the labellum have glands that secrete a substance attracting midge fly pollinators. A number of *Bulbophyllum* species are thought to attract pollinators with tremulous floral parts (van der Pijl and Dodson 1966, Dressler 1981). However, experimental data are lacking linking pollinator attraction to the tremulous perianth parts. Further studies should test whether pollinators are attracted to gland secretions or tremulous floral parts.

ACKNOWLEDGEMENTS

I thank Peter Cranston for identifying the midge species and providing notes on the distribution of the insect and Betsy Jackes and Tony Slater for comments on the manuscript.

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AUSTRALASIAN ORCHIDS ILLUSTRATED

No. 15: *Spathoglottis plicata* Blume

Common Name: No generally accepted common name — occasionally known as "New Guinea Ground Orchid"

Subfamily: Epidendroideae
Tribe: Arethuseae
Subtribe: Bletiinnae
Genus: *Spathoglottis* Blume

Distribution: *Spathoglottis* is a widespread genus occurring from India to the Pacific islands with two species in north-eastern Australia. *S. plicata* is the most widespread of the species and has been recorded in India, Thailand, Burma, Malaya, Philippines, Indonesia, New Guinea, the Solomon Islands, New Caledonia, Tonga and Samoa (Cribb and Tang 1982). It is naturalised in the Hawaiian Islands and Africa. In Australia it has been recorded from the northern part of Cape York Peninsula from the Endeavour River to the Jardine River.

Notes: The genus *Spathoglottis* includes about 30 species, but is taxonomically confused and in need of revision. *S. plicata* is a well-known species which is often cultivated, but was only recognised as being an Australian species in 1982. The Cape York plants are relatively large, with leaves about half a metre or more long and a flower spike which can reach a metre tall. The flowers are about 3cm across and open progressively so that four or five are open at any time and the plant is in flower for a month or so. The flowers in all Australian plants seen so far are purple, but white flowers are not uncommon overseas and it would not be surprising if white flowering plants were found in Australia. The flowering season in the natural habitat is spring and summer. The leaves are pleated (plicate), about 40–90cm long by 2–8cm wide and arise from an above ground pseudobulb about 2–5cm in diameter. The plants grow in permanently moist soaks in sandy areas, usually in dense vegetation.

Pollination: There is no recorded pollinator for this species.

Conservation Status: This is quite a rare species in Cape York and the Australian populations are rated as "vulnerable" by the Queensland Herbarium (1993). The vulnerable rating is due to the desirability of this species to collectors and to the relatively small populations in the wild. Plants are occasionally dug up by feral pigs. It is moderately abundant in many areas overseas.

Culture: *S. plicata* is a common plant in culture and is extensively grown as a garden plant in the tropics, where it requires a rich, well drained soil, plenty of watering and a sunny position. It is also well suited to pot culture in a well drained terrestrial mixture. It should be kept warm in winter in the southern states and does best in strong light and evenly moist conditions.

Illustration: By Louise Saunders, 8 Lisa Street, Cleveland, Queensland 4163.

Description: By Bill Lavarack, 37 Bay Street, Pallarenda, Queensland 4810.

Line Drawings and Captions: By Bruce Gray, 48 Loder Street, Atherton, Queensland 4883.

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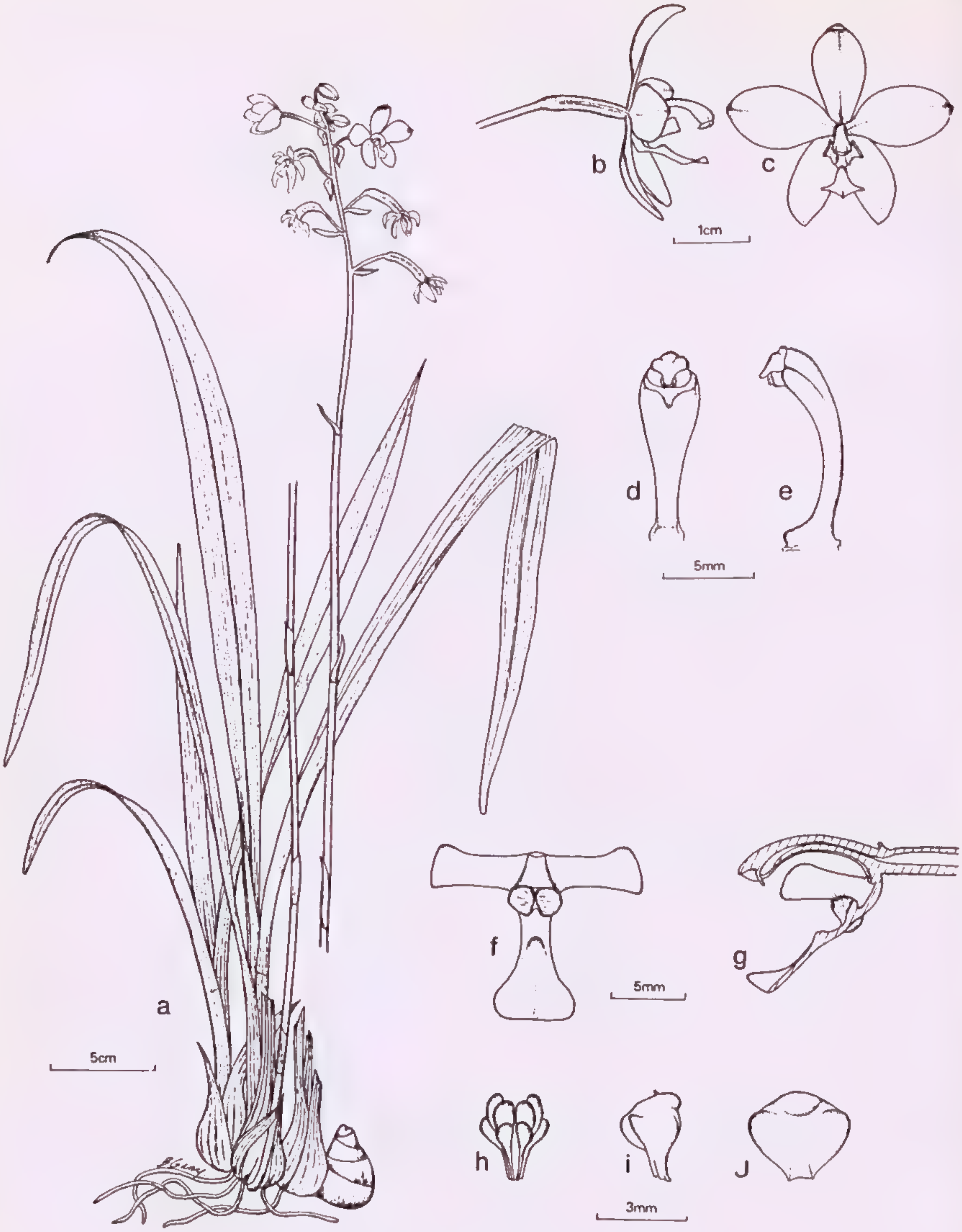

Spathoglottis plicata Blume

a. Habit
b. Flower from side
c. Flower from front
d. Column from front
e. Column from side

f. Labellum flattened out
g. Flower in longitudinal secion
h. Pollinia
i. Anther from side
j. Anther from front

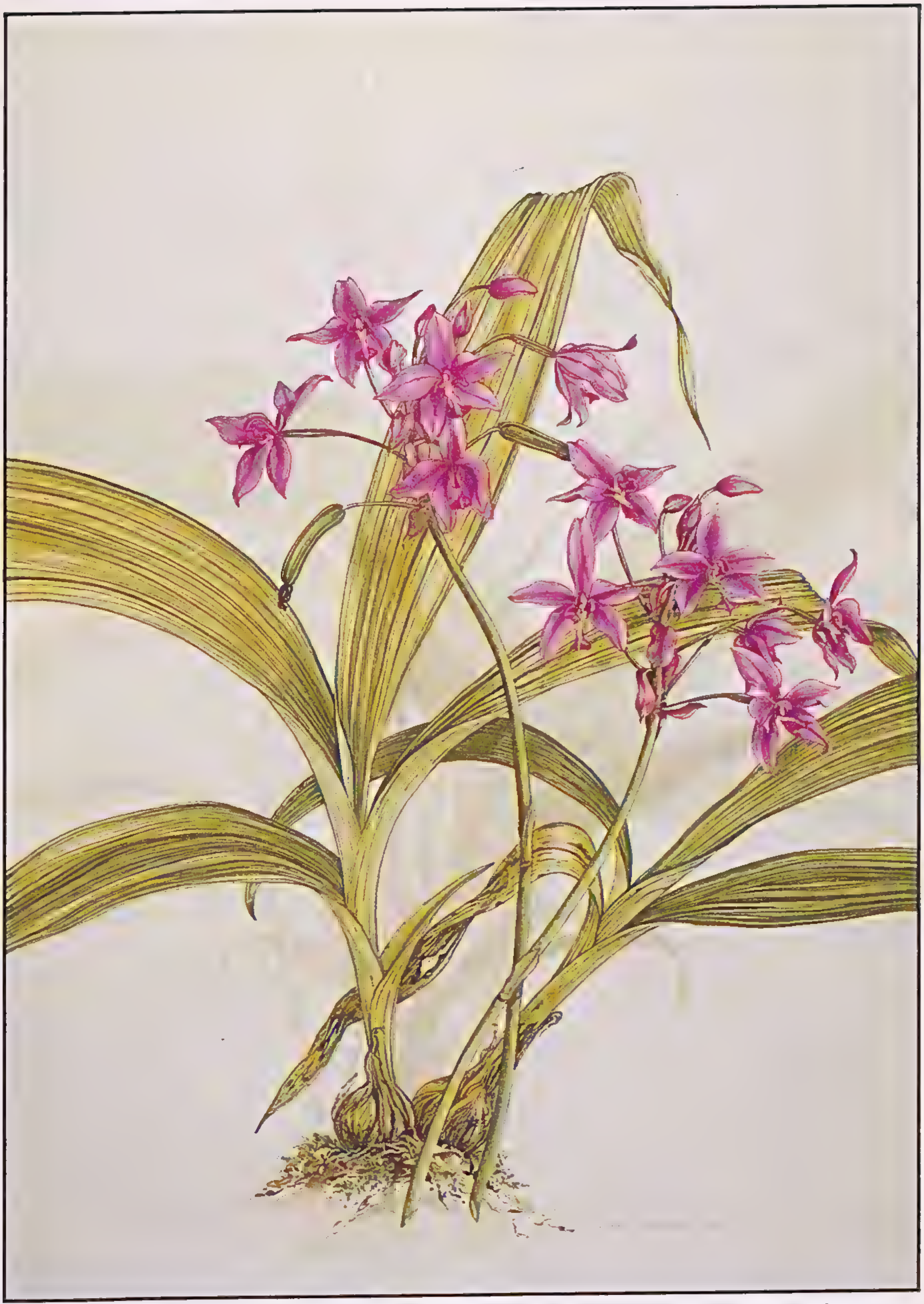

Plate 8: *Spathoglottis plicata* Blume. From a painting by Louise Saunders.

THOUGHTS AND OBSERVATIONS ON RED SPOTTED *DENDROBIUM SPECIOSUM*

Neil and Meg Finch
Down Under Native Orchids
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Over the past few years there has been a lot of talk about plants of *Dendrobium speciosum* that have varying amounts of red markings on the floral segments. During this time I have observed many of these plants and spoken at length with many experienced growers about this phenomenon and feel confident enough now to make public my thoughts on this matter, however I must stress at this point that they are just that, my thoughts and growers of plants of this type should wait for conclusive evidence before deciding what they should do with these plants.

I strongly suspect that this phenomenon is caused by the presence of an as yet unidentified virus which is infecting these plants. My reasons for thinking this are as follows:–

1. All the subject plants that I have seen are poor performers, rarely flowering well and usually exhibit smaller than normal flowers on small twisted racemes. The flower count is also usually much lower than one would expect. Further, many of these plants have mutated flowers on these racemes. It does appear that this phenomenon moves through the plant relatively slowly and it is possible a plant may only show these symptoms on the racemes of older pseudobulbs whilst the racemes on new growth sections do not. I would suggest that such plants have not been infected for very long.
2. Most of the subject plants are poor growers and suffer more problems from fungal infections in the roots as well as the leaves, possibly due to a weakened immune system caused by the virus. The new growths on such plants often show chlorophyll deficient sections randomly distributed. This is most observable when these growths are immature. At this young stage the leaves look like they are variegated, however it is often hard to spot. This type of symptom is common in other virus-infected plants.
3. One of the most convincing pieces of evidence is that there are some collections around, where these plants are present, within which this phenomenon has spread to other plants of *D. speciosum*, which have been in cultivation for many years but only recently started flowering with red markings on the flowers. These collections are often neglected and suffer from aphid infestation and I strongly suspect that they may be one of the vectors. It makes me suspicious when only a few years ago red spotted *D. speciosum* was unheard of, now however many growers are saying that they have more and more of them showing up in their collections each year. If this is a virus then it spreads quite quickly under the right conditions.

Although no conclusive evidence that this phenomenon is a virus exists at present, I personally am convinced that it is and I am not alone in this thinking. I therefore hope other lovers of our native orchids will listen and take extreme care when handling these plants until an answer can be given by those currently carrying out tests on some of these plants. In the meantime I would recommend that growers take the following advice:–

(a) Isolate these plants from all your other plants.

(b) Insure that these plants don't become pest infected as they may spread it to your other plants.

(c) Don't cut any part of these plants unless all your implements and your working area is thoroughly sterilised after being in contact with them. Don't forget to wash your hands.

(d) Don't reuse anything that has been in contact with these plants, such as pots, tags, compost, etc., as they can also spread virus to the next plant they contact.

(e) Don't trade or sell these plants as you may be the cause of the further spread of this problem. It is not fair to sell these plants to unsuspecting beginners.

(f) If you have purchased seedlings from plants exhibiting these symptoms they may not be infected if the breeder used dry seed and not a green pod. There is strong evidence that most of the seedlings from a normal dry seed pod will normally not carry a virus, even if the parents were infected, however this is not a 100% guarantee, so these should also be isolated. If ultimately the seedling flowers normal colour then it is probably clean. If it flowers with the red spots then I would be very careful with it until final results are published.

If this proves to be a virus then we will all need to work together to halt its spread so that this most magnificent species can be saved. Remember to be forewarned is to be forearmed! ✤

1st CHARITY FESTIVAL OF ORCHIDS — DAYBORO, QUEENSLAND, 1994

Eric Wilde
15 William Road,
Little River, Victoria 3211

Frank and Bev. Simpson of Simpson Orchids, Mt Mee are to be congratulated on sponsoring the Charity Festival of Orchids held on 2nd October, 1994 in the Dayboro Community Hall.

Dayboro is a small village about 44km north of Brisbane, an ideal venue for a Victorian to visit at the end of what has seemed a long winter . . . a great reason to escape Melbourne for a long weekend.

The Show was the first of many (I hope) and the attendance was excellent, with several buses bringing orchid club members from the Brisbane and Beaudesert areas.

The flowering season in Melbourne has seemed a bit crazy due to very heavy frosts which caused the dendrobiums to loose their buds and slow down the *Sarcochilus* by at least four weeks. Brisbane was very similar, in fact I was told they had a 3°C the week prior to the show. It takes more than this to stop real orchid growers and hence on entering the hall we were immediately impressed with the array of orchids — all Australian native species and hybrids. There was a beautiful group of *Cymbidium canaliculatum,* six plants of various colours from a lime green albino form to the highly prized 'Sparksii' form, all plants showed excellent culture.

The next spectacle was some 15" saucers of *Dendrobium kingianum* brought in by Ted and Barbara Gregory, they certainly know how to grow them to perfection and the rich ruby red of Ted's 'Red No. 2' sure was a picture and justly received a first prize.

Other plants that stood out were two beautifully grown plants of *Plectochilus* Kilgra — a lime green, each with five inflorescences of 10–12 flowers — a joy to behold. There was a very colourful group of *Parachilus* Tigersun — all different in shape, size and colour.

For a southern grower the sight of the delicate *Dendrobium canaliculatum* always causes a little envy and to add more salt to the wound a half dozen hybrids — *D.* Gloucester Sands, with their glossy arching racemes — "why can't I grow these marvellous plants like that?" Terrestrials were a little light on, but there was a fine *Phaius tankervilliae* with two monster racemes each with a dozen flowers — 6' above the bench.

It's fine to speak of the display plants, but we all know why we go to these shows — don't we? . . . for the sale plants . . . hundreds of flasks of species and exotic hybrids . . . all Aussie natives, especially in the *Sarcochilus* family . . . yes . . . many followed us home.

The Champion Orchid of the Show was a *Sarcochilus* Melba (Plate 9) belonging to Ted and Barbara Gregory — a beautiful plant with more than 60 large white flowers beautifully displayed and grown.

The Reserve Champion was a *Pterostylis rufa* (Plate 9), grown by 15-year-old Brandon Hazelwood. This exhibit had four stems with six flowers per stem — the red tinge to the flowers made it most attractive. Congratulations Brandon, there will be more rewards for you if you keep growing your plants like this one.

The Show was judged by the judging panel of A.N.O.S. Northern Regional Council.

The bonus of these shows is in meeting other growers and sharing experiences, so thank you new and old friends for your company and I hope we meet again next year. ✾

FIRST CHARITY FESTIVAL OF

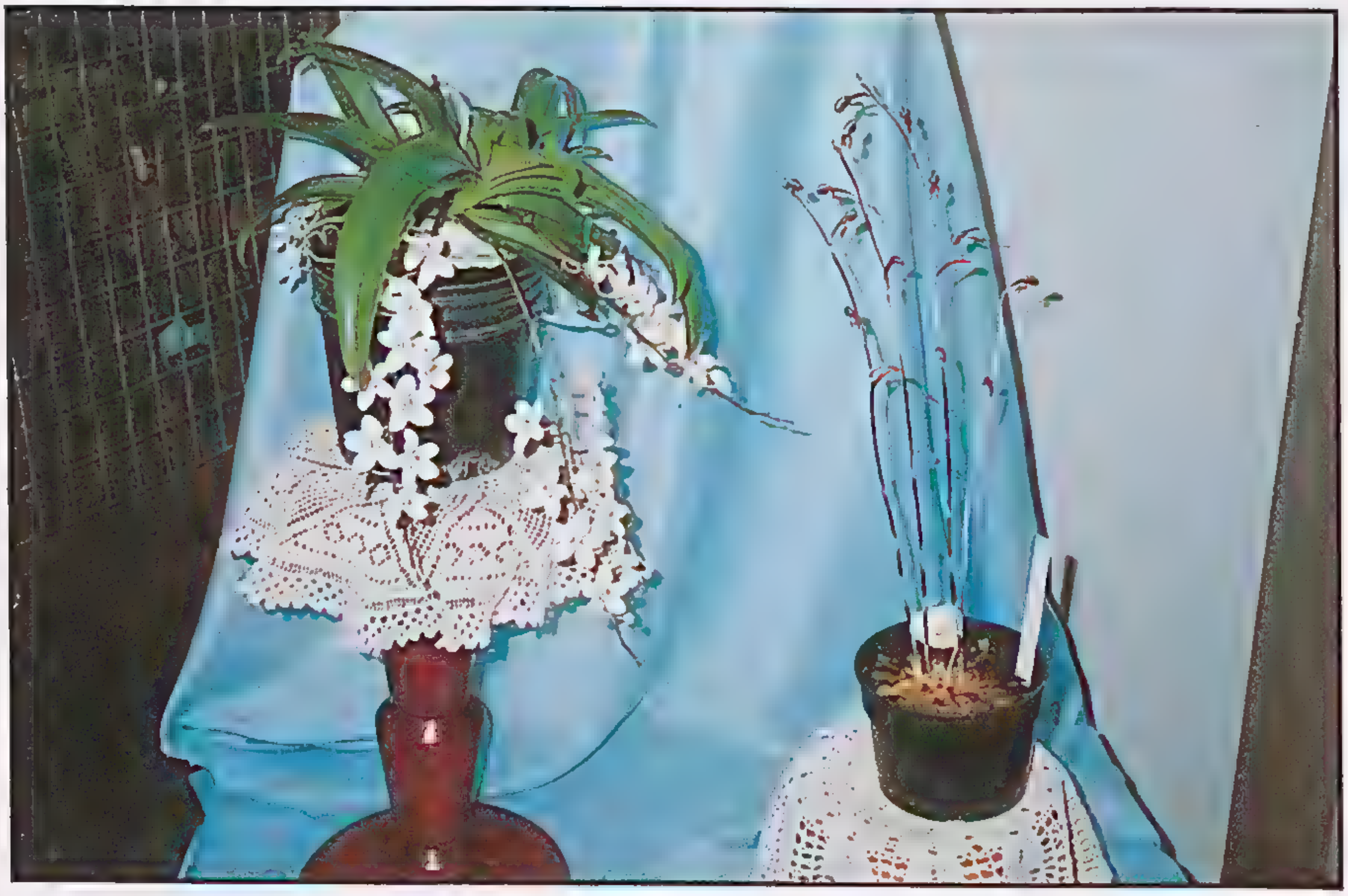

Plate 9: Champion–*Sarcochilus* Melba — Reserve Champion–*Pterostylis rufa*.

Plate 10: Ted Gregory with his specimen plants of *Dendrobium kingianum*.

Photos: W. T. Upton.

Plate 11: General view of show.

SIZE DOES MATTER.

Plate 12: John Hazelwood, Registrar of Judges A.N.O.S. Northern Regional Council

Photos: W. T. Upton.

AUSTRALIAN NATIVE ORCHID HYBRID REGISTRATIONS

(New registrations from lists in *The Orchid Review,* July/October, 1994):–

Name	Parentage	Registered by
Dendrobium		
Elegant Glow	Peewee x Harold Hirsch	W. T. Upton
Ellen Surprise	Lorikeet x Ellen	Florafest (I. Klein)
Florafest's Victory	Aussie Victory x *tetragonum*	Florafest
Galactic Gold	Susan x *tetragonum*	O. Blumhardt
Jesmond Treasure	Aussie Ira x Zip	J. Purvis
Lustrous	Peewee x Sunglow	N. Finch
Manellae Gold	Lynette Banks x *falcorostrum*	M. Lynch (S. Batchelor)
Margaret McDonald	Pauline Rankin x *bigibbum*	I. McDonald
Memoria Ray Hill	Kim Heinze x Pauline Rankin	Avril Hill (Ray Hill)
Royal Reward	Star Imp x Zip	R. & D. Sheen
Toowoomba Gold	Lemon Glow x Karen Nair	W. T. Upton
Vivid	Red River x Zip	N. Finch
Parachilus		
Bobby-Dazzler	*Sarco.* Pinkhart x *Prcls.* Riverdene	N. Finch
Polka-Dot	*Sarco.* Pinkhart x *Psarco. hirticalcar*	N. Finch
Sarcochilus		
Sue	Empress x Kathy	W. T. Upton

CORRIGENDA — Orchid Review list of February, 1992, *Dendrobium* Anne's Rainbow — withdrawn due to incorrect parentage. Should the cross (*D.* Aussie Angel X *D.* speciosum) be applied for in future, the grex epithet *D.* Anne's Rainbow must be used.

GROWING *DENDROBIUM LASIANTHERA* IN SOUTH-EAST QUEENSLAND

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I was both surprised and thrilled when Mr Walter Upton asked me during the N.M.Q.O.C. Inc. International Festival of Orchids in Brisbane recently, if I would contribute an article to *The Orchadian,* about the grand champion of the show *Dendrobium lasianthera* 'Sophia' AM/QOS (AOC pending) (Plate 13).

We purchased our plant from a nursery at Mission Beach, north Queensland, in 1989, as a seedling (about 45cm high) on one of our many sojourns to the north with our friends Clive and Pat Mann. It was purchased as the type form 'May River Red', but we were told when it first flowered that it was more than likely the form 'Veronica Somare'. However, on speaking with Andree Miller at the Festival, she advised us that it is more like the type form 'Sepik Blue'.

We at first tried to grow it in our open tunnel house (solar weave over and 70% sarlon ends), but the cold winter nights played havoc with it. It shed nearly all its leaves and looked really tatty. However, the decision was then made that if we wished to grow species like this well, then we really did require a hot house, hence the construction of same the following year.

The hot house is 6m x 6m with louvres set low beneath the benches on three sides. It is lined (for insulation) with clear solarweave on the walls. The roof is opaque double wall polycarbonate (rather expensive but has a 10-year guarantee). A 12" whirlybird is set into the roof near the peak and a 48" ceiling fan (soon to be two as I found one is not enough) which runs 24 hours per day on low speed. Barry has also built a small sliding panel directly beneath the roof vent, to close it off once the temperature starts to drop late afternoon. The floor is covered with coarse river gravel, which retains moisture fairly well.

D. lasianthera is grown in this environment along with *Phalaenanthe* dendrobiums, *Phalaenopsis* angraecums and many other species and vandaceous orchids.

It is presently potted in a 8" squat pot containing about one third of polystyrene in bottom for drainage (big pieces) and then filled with faily coarse bark and charcoal mix.

The plant is hung slightly to one side of the roof vent, but where it receives plenty of air movement from the fan, but is also placed high enough to gain maximum warmth from the roof without burning.

Watering is carried out by hand, every two or three days during the hot weather, but misted every other day when floors and under the benches are misted (first thing in the mornings and sometimes three or four times during the day). Fertilising is carried out regularly throughout the year. During summer a full strength fertiliser is applied weekly but once the weather cools off, it is cut back to fortnightly or even less frequently in the really cold months of July and August. To date we have tremendous results with using Aquasol and then when plants are almost dried off, follow up with calcium nitrate and epsom salts. Even though we cut back on watering during winter, we still maintain damp floors for humidity.

A small fan heater is used for the months of May/June to August/September depending on temperatures. It runs from 6pm to 7am, but we are able to maintain a temperature of 12° and this seems to be enough to prevent leaf loss.

It is sprayed along with everything else for slugs and snails using Baysol and for prevention of fungus problems using Mancozeb. We prefer to use predatory mites for control of red spider, however if infection is bad we spray with a miticide (Malathion or equivalent).

They do grow to rather large plants, but if you have the room, they are very rewarding as the flowers last a couple of months and more.

D. lasianthera 'Sophia' AM/QOS received the Award of Merit in January, 1994 with two racemes of 21 and 25 flowers.

This flowering there were four racemes of 14, 15, 16 and 17 flowers. On 7/4/1994 at Sunshine Coast Orchid Society Show, it won Best Species, Most Pre-eminent Entry and Champion of the Show. Then on 29/4/1994 at N.M.Q.O.C. Inc. Festival it again scooped the pool by winning Champion Dendrobium, Champion Species and Grand Champion of the Show. (See Plate 13).

There is no doubt she has rewarded us well for our small investment. ✻

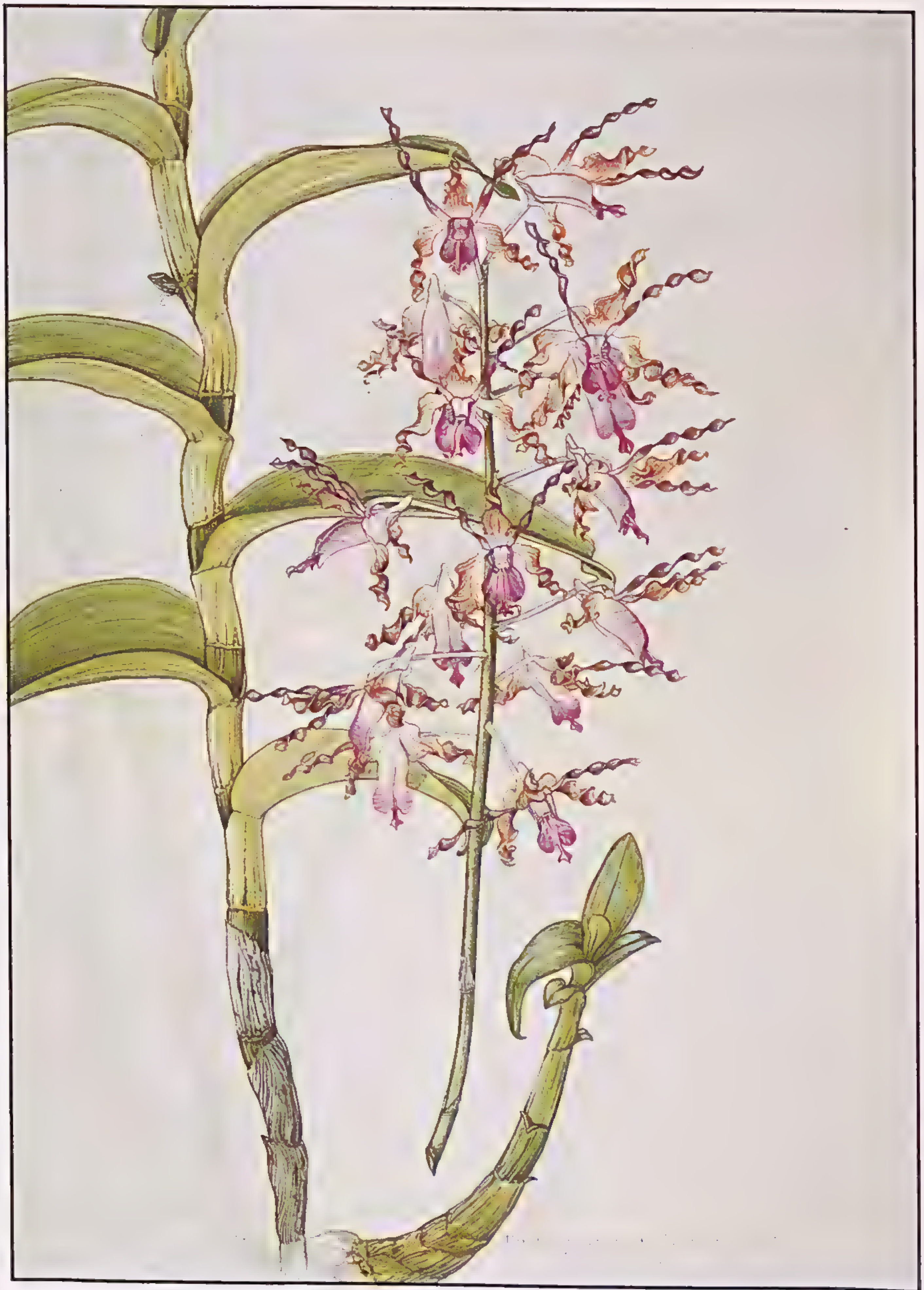

Plate 13: *Dendrobium lasianthera* 'Sophia'. From a painting by Louise Saunders.

NOTES ON *CORYBAS DIENEMUS* (HOOK. f.) D. JONES ON MACQUARIE ISLAND

Robert Gibson

Corybas dienemus (Hook. f.) D. Jones has only recently (Jones and Edgar, 1993) been recognised as a distinct species and is endemic to Macquarie Island (54° 30'S, 158° 57'E). Previously it had been treated as *C. macranthus* (Hook. f.) Reichb. f., which occurs throughout New Zealand (Brown et al, 1978). This species is of interest for it is the only orchid in a subantarctic environment. Macquarie Island has only risen above sea level within the last ca. 250,000 years (Selkirk et al, 1990), so it is likely that this species has evolved only recently.

From December, 1992 to March, 1993, I was involved in field work on a vegetation mapping project on Macquarie Island, during the course of which I observed *C. dienemus* in several locations.

C. dienemus is a small, summer-growing tuberous-rooted perennial, which is probably winter-deciduous. It occurs in open wet bog (mire) communities between approximately 5 and 150 metres elevation and is locally common. Contrary to Brown et al. (1978), this species grows in mire sites which receive water from springs (e.g. upslope of Bauer Bay field hut) and creeks (e.g. just south-west of Halfway Hill and in the lower Green Gorge Basin), in addition to direct rainfall. Also, in the two locations I found this species on the raised coastal terrace on the west coast, the mire received creek water. In all cases the water in these sites is moving by either slow stream-flow or in response to the slope.

The plants typically grow in a medium of partially decomposed vegetation (including *Breutelia pendula* (Brown et al, 1978)), in which the water table is located 3 to 10cm below the surface. The main tuber is located at, or just below, the water table surface and produces a succulent vertical stolon which terminates in a fleshy reniform leaf, to 2cm long and wide. This is often folded at the lower (anterior) ends to form a shallow inverted cone, the rim of which is at the surface. One or two subvertical stolons arise from just above the main tuber and terminate in a small secondary tuber. These are likely to produce a leaf the following summer. It is due to these secondary tubers that *Corybas dienemus* is able to form colonies covering over one square metre. This orchid is commonly found in the company of *Epilobium brunnescens* (*Onagraceae*), *Colobanthus quitensis* (*Caryophyllaceae*), *Ranunculus bitematus* (*Ranunculaceae*), *Hydrocotyle* sp. (*Apiaceae*) and occasionally *Acaena magellanica* (*Rosaceae*), *Pleurophyllum hookeri* (*Asteraceae*), *Luzula crinita* (*Cyperaceae*), *Isolepsis aucklandica* (*Cyperaceae*), *Juncus scheuchzerioides* (*Juncaceae*) and *Stilbocarpa polaris* (*Araliaceae*). In addition it is commonly found in the company of the liverwort *Marchantia berteroana*, which has irregular leaves of similar colour, size and form to those of this orchid.

Occasionally *Corybas dienemus* grows under the leaves of large herbs (notably *Stilbocarpa polaris*). In this situation the stolon extends above the surface and carries a flattened, relatively thin leaf. It is interesting to note that (introduced) rabbits eat the *Stilbocarpa* leaves, but not those of the *Corybas.*

Half of the 10 colonies seen produced flowering plants, these were all at below 50 metres elevation and comprised of a colony in the lower Green Gorge Basin, two colonies on Featherbed north of Bauer Bay and two of the eight colonies above the Bauer Bay field hut. In all cases only a small percentage of tubers had flowers. None of the plants in the colony south of Halfway Hill, at approximately 100 metres elevation, had flowers, which may be due to the elevated, slightly cooler environment. The scape is attached 1 to 2cm below the leaf. However, the flower is often held at the base of the concave leaf and appears sessile. I observed the plants in flower in mid-December, but there may have been plants flowering since late-November. The flowers were not studied in detail, but are red-brown narrow tube, with an arched dorsal sepal which rises above the subequal lateral sepals and petals. The latter terminate in an elongate projection.

Although few flowers are produced most were seen to be pollinated, but few fruit survived to early March when the seed is shed. The majority of fruit ripens whilst still in contact with the leaf, however, in one plant found near the Bauer Bay field hut the pale green fruit capsule (10mm tall by 5mm diameter) was held 4cm above the ground on a green stalk 3mm in diameter.

No pollinating agents were seen, although it is possible that this species may have the ability for self-pollination. The only evidence for animal interactions was the occasional uprooting of plants in a colony, with the removal of tubers and ripening fruit. This is most likely done by Great Skuas (*Stercorarius skua lonnbergi*) and may also have been done by Wekas (Brown et al, 1978), prior to the recent eradication of this introduced bird.

In conclusion, *Corybas dienemus* is an interesting endemic component of the flora of Macquarie Island.

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WHAT'S IN A NAME?

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Probably few of us like change, especially in a field where we have labouriously built up knowledge over a number of years. If we do not know the reasons for the changes or do not understand them fully, they may appear to be arbitrary and this can lead to resentment and hostility. Perhaps this is the reason behind much of the unrest about the recent name changes involving some of our better known native orchids.

Many of the complaints are understandable as it is inconvenient to have to change the labels on our plants and learn the new names. We may feel overwhelmed by the flood of changes. All that knowledge we had is suddenly obsolete. A heated debate now rages over the validity of some of those name changes. A debate that unfortunately, at times, generates considerable heat but not necesarily a great deal of light. Feelings run high and the whole thing develops into a slanging match, degenerating into one about personalities, which simply obscures the issue. Debate is fine, but it should be done in a calm and rational manner, without recriminations or abuse.

No matter how we feel about the name changes, we must have rules governing what name is acceptable. Without these rules we have chaos, with names being capriciously accepted or rejected. The name of a species would vary from person to person and place to place making communication much more difficult.

There are a number of reasons why names get changed. We may discover that another name has priority because it was named by somebody earlier. No matter how much we prefer the previously accepted name, the older name must be accepted. This is the only logical way to operate. The validity of names cannot be decided on whim, our naming system must be consistent. Surely the person who first validly described and named the species deserves to have that name accepted. No matter how comfortable we are with the name *Dendrobium ruppianum*, it must be replaced by the name *D. jonesii*. I would point out that the name *D. ruppianum* only dates from 1964 when it replaced *D. fusiforme*, a name that was invalid because it had been used by Louis Thouars in 1822 for another *Dendrobium*.

Another reason for a name change may be where two or more species have been incorrectly identified because of confusion over the interpretation of the original descriptions. The name changes involving *D. bowmanii*, and *D. mortii* are of this type. Inconvenient as it may be, we must accept the name as determined by the original description.

The third reason for a name change is where a previously accepted species is split into two or more new species. As more material becomes available, our understanding of the species improves. What was once considered to be a single variable species may be seen to be two or more closely related but distinct species. Whether this should result in the naming of new species or to regard them as being simply vaireties of the same species is a philosophical question that often causes fierce argument.

A good example of such a case is the current "discussion" about the status of *D. tetragonum*. Although it has nothing to do with the botanical correctness of splitting *D. tetragonum* into a number of species, this change should be of great benefit to hobbyists. How often when buying a hybrid bred from *D. tetragonum*, have you wondered which tetragonum was used, as "which" has an important bearing on the appearance of the resulting offspring. This becomes even more important if the plant also involves another "variable" species such as *D. bigibbum*. A hybrid with *D. tetragonum* in its background is likely to be significantly different to one involving *D. melaleucaphilum* or *D. cacatua* (*D. tetragonum* var. *giganteum*) or *D. capitisyork* (*D. tetragonum* var. *giganteum*). Being able to distinguish among these different crosses will now become possible.

As inconvenient as the name changes may be in the short run, they will probably be of benefit to hobbyists in the longer term. The work being done by botanists at present is increasing our understanding of our native orchids. The problem is the flood of information we are trying to assimilate. The determinations of the botanists need to be calmly and rationally assessed. Despite what we may sometimes think, botanists have good reasons for changing the names of plants. Before we reject these names out of hand we should consider the reasons for the changes. The current work being carried out by a number of botanists into the status of the various native orchid species will be of long term benefit to the hobby and so should be encouraged and supported, no matter how inconvenient or unpalatable the results may be in the short run. ✻

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RECENT ADVANCES IN HYBRIDISATION OF AUSTRALIAN TERRESTRIAL ORCHIDS

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INTRODUCTION

The hybridisation of Australian terrestrial orchids is 20 years behind the epiphytes. It was not until the late 1970's that a small group of enthusiasts in Adelaide started hybridising. Some of us had met at local orchid clubs and others through interstate membership of A.N.O.S. — Victorian Group. When the Native Orchid Society of South Australia was formed in Adelaide in 1977, there was the opportunity for close collaboration and the infectious enthusiasm this brings. A sprinkling of hybrids were registered in the early 1980's with numbers increasing later in the decade. Only four genera are represented so far in the hybrid lists. These are *Caladenia, Diuris, Pterostylis* and *Thelymitra.* All are larger flowered, easily grown orchids which are popular in cultivated terrestrial collections. Most hybrids have hybrid vigour so are easier to grow and flower than the parent species.

I know that South Australians are not the only ones making terrestrial hybrids, but to date all of the 25 registered deciduous terrestrial hybrids have been registered by growers from S.A. Registrations have been slow in the '90's with only four new registrations since the Wollongong Conference in 1990. This does not mean that hybridising has slowed down. The turmoil created by numerous name changes and species splitting and the subsequent identification uncertainties of species parents has had a delaying effect. I expect that there will be a surge of registrations in 2–3 years time. Let us consider each of the four genera in turn:–

Caladenia

Caladenia hybridise freely in the bush. Many natural hybrids are known. Unfortunately the spider types are difficult to maintain in cultivation because these plants cannot survive for long without their associated fungus. Hybrids are easy to make, seed is produced in good quantities and most of it germinates when flasked, even asymbiotically. The cultivation difficulties become apparent when the seedlings are planted out. Either the seedlings rot away or they fail to grow properly and may exist for years without ever reaching flowering size.

All is not lost because there are a few species which are easy to grow. The most important is *C. latifolia* which has large hairy leaves and an annual multiplication rate of 2.5. It is rather shy flowering, producing up to three pretty pink blooms in early spring under favourable conditions. We have crossed it with the rare white spider, *C. rigida,* to produce *C.* Fairy Floss. *C.* Fairy Floss is pink, easy to grow and flower and it doubles in number each year. We have remade this cross using white parents, but after years of waiting have still not flowered any seedlings. *C. latifolia* x *C. patersonii* looks like a large Fairy Floss and has pink flowers.

A *C. latifolia* hybrid with *C. flava* won the Ira Butler Trophy for Bob Bates in 1991. Bob produces potfuls of this showy orchid for the N.O.S.S.A. spring show in Adelaide each year.

C. tentaculata x *C. patersonii* is a tall showy hybrid but it seldom multiples. Several hybrids have been made using *C. menziesii,* which is an easy species to grow, but none have flowered yet. Intergenerics with *Glossodia major* are known in the bush and seedlings have been raised but make slow progress.

There is enough work in this genus to keep 100 hybridists busy.

Diuris

The donkey orchids hybridise freely in nature and so called "hybrid swarms" have been described. I have found that while primary hybrids are easy to make, there are many difficulties in producing second generation hybrids. Even in the first generation there are a high proportion of deformed flowers in some crosses. *Diuris* are prone to several leaf diseases not seen in other genera, which tends to limit their numbers in collections. They prefer heavy soil mixes, high light intensity and good air movement over the plants. Well grown specimen pots are very spectacular.

The early man-made hybrids used the three common South Australian species *D. corymbosa* (syn. *D. longifolia*), *D. pardina* (syn. *D. maculata*) and *D. lanceolata* (syn. *D. pedunculata*). These are all easy to grow. They flower in August-September in Adelaide for the spring shows. Their flowers are not as long lasting as those species which flower in late spring when it is warmer. *D.* Pioneer (*D. corymbosa* x *D. pardina*) was the first to be registered in 1981. It has 5–10 large creamy brown flowers which open progressively. *D.* X*palachila* (*D. pardina* x *D. lanceolata*) which occurs frequently in the bush, has large heavily spotted cream and brown flowers. The third hybrid *D.* X*polymorpha* (*D. lanceolata* x *D. corymbosa*) has creamy yellow flowers on tall stems but deformities are common. *D. punctata,* the purple diuris, when crossed with yellow or brown species produces unattractive muddy coloured hybrids. *D.* Harlequin (*D. corymbosa* x *D. punctata*) is one of the best. A striped purple hybrid has been flowered between *D. punctata* and *D. venosa* but as it is very late it does not last well in the heat of November.

A group of attractive yellow hybrids have been produced using *D. aurea, D. lanceolata* and *D. drummondii. D. aurea* from the eastern states and *D. drummondii* from Western Australia are both tall, strong multiflowered orchids. *D.* Golden Wand (*D. aurea* x *D. drummondii*) is more than half a metre tall and has large long lasting late flowers.

Spotted diuris result from the cross *D. sulphurea* x *D. brevifolia.* As *D. sulphurea* petals reflex strongly, this hybrid does not have the flat shape that judges like but it is a very rewarding orchid. For the show bench the best hybrids so far are combinations using the Western Australian forms of *D. corymbosa* which has recently been split into several species. The large flat filled in flowers of the species are passed on to the hybrids.

Pterostylis

We have seen the greens, the browns and the reds. The whites are coming and they will be followed by the yellows and oranges. Who knows if blue greenhoods are possible? Some of the rufa types have the most beautiful clear glasslike petals so we may see colourless greenhoods.

There are stripes, velvet textures, elongated sepals and lips, hairy lips, multiflowered hybrids, 50% caulines and even a Triffid.

Greenhoods will grow anywhere so it is no surprise to see so many hybrids on the list. It is not uncommon for hybrid seedlings to flower within two years of deflasking. Consequently *Pterostylis* hybrids are the most advanced of all the terrestrials with third generation crosses registered (*P.* Velvetine and *P.* Marelba).

Important parents for green hybrids are *P. baptistii, P. furcata, P. nutans, P. curta, P. concinna, P. ophioglossa* and *P. procera.* My favourite hybrid from this group is *P.* Jack Warcup (*P. baptistii* x *P. furcata*) which has a large green and white flower in September-October after most other greenhoods have finished.

Brown hybrids result from using parents such as *P. cucullata, P. pedunculata* and *P. abrupta.* The best of this group is still *P.* Cutie (*P. baptistii* x *P. cucullata*). This hybrid regularly wins spring shows with its spectacular large brown, green and white hooded flowers on strong stems. The darkest hybrid is *P.* Chocolate Drop (*P. pedunculata* x *P. cucullata*). The flowers, which are on the small side, are a dark chocolate brown colour.

Red hybrids are most recent and we are still working in this area. Parents used include *P. rogersii, P. coccinea* and *P. taurus.* the last species is a miniature species from the Atherton Tableland and is not easy to breed with. The best hybrid in this group so far is *P.* Sentinel (*P. abrupta* x *P. rogersii*). This is a 100% cauline which flowers in May in Adelaide for the autumn shows. It is more free flowering than either parent and the sepals have long attractive extensions.

White forms of species appear now and then. The best is the white form of *P. nutans* which originated in Victoria. This may produce a group of white greenhood hybrids. A yellow form *P. concinna* could be the forerunner of yellow hybrids. Other special clones may be discovered at any time.

Thelymitra

The sun orchids are amongst my favourite terrestrials. They come in all the colours of the rainbow including the most beautiful blues. Their main drawback is that the flowers close at night and do not open during the day unless the temperature rises above about 22°C.

Thelymitra antennifera (Rabbit Ears) is one parent of both hybrids registered to date. It is a dwarf plant bearing two or three yellow flowers on a zigzag stem. It is easy to grow even though the tubers are small. Its multiplication rate is 2.5. The flowers emit a delicious vanilla scent. *T.* Melon Glow (*T. antennifera* x *T. luteocilium*) has three or four watermelon pink flowers on a plant about 300mm tall. This hybrid is a vigorous, free flowering, fast multiplying orchid. *Thelymitra* hybrids often have very intense colours with each parent reinforcing the other.

The best clones of *T.* Kay Nesbitt (*T. antennifera* x *T. rubra*) were made using a very dark pink form of *T. rubra* from the Adelaide Hills. These first flowered in spring 1991 with very intense dark pink coloured blooms of good shape. They glisten like jewels in the sunlight. Plant size and shape is similar to *T.* Melon Glow.

I have yet to see flowers of hybrids between *T. antennifera* and the blue species, *T. nuda, T. aristata, T. ixioides* and *T. crinita.* There has been much speculation in the past about the identity of natural hybrids with dark pink to red flowers, some believing that one parent is blue. I would expect a yellow crossed with blue to give green flowers. We should have proof this year or next when our seedlings flower.

Striped and spotted *Thelymitra* hybrids are possible. We have flowered *T. longifolia* x *T. pulchella* which has light blue flowers with dark blue stripes. This cross was made by Doug McCrae using New Zealand species. We are having good results with *Thelymitra* and hope to continue to invest time and effort in this genus to produce both species and hybrid plants which grow, multiply and flower reliably. I can see the day when sun orchids will be displayed in warm cabinets so that their beauty can be enjoyed whatever the weather.

SUMMARY

We can all look back and build on the past. What of the future? The genetic material of 100's of species is available. Hybridists need the will and the techniques. I feel that progress has been very slow to date. What is needed is more hybridists devoting more time to terrestrials. The epiphyte hybridists have created a large number of hybrid seedlings and since growers demand something new each year, the market continues to expand.

Terrestrial hybridists are following the same path but tend to dawdle along and are still preoccupied with building species collections.

This list is my personal opinion of the 10 best terrestrial hybrids that I have seen in cultivation to date. Some are old favourites which have been around for 10 years or more while others are new:–

Caladenia	
Fairy Floss	(*C. rigida* x *C. latifolia*)
un-named	(*C. latifolia* x *C. flava*)
Diuris	
Golden Wand	(*D. aurea* x *D. drummondii*)
un-named	(*D.* X*palachila* x *D. corymbosa*)
un-named	(*D. brevifolia* x *D. lanceolata*)
Pterostylis	
Cutie	(*P. baptistii* x *P. cucullata*)
Jack Warcup	(*P. baptistii* x *P. furcata*)
Sentinel	(*P. abrupta* x *P. rogersii*)
Thelymitra	
Kay Nesbitt	(*T. antennifera* x *T. rubra*)
Melon Glow	(*T. antennifera* x *T. luteocilium*)

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SHOW REPORTS

A.N.O.S. NEWCASTLE GROUP — SPRING SHOW 1994

Peter Presland, Show Marshall

A.N.O.S. Newcastle Group's Spring Show was held at Lake Macquarie Fair Shopping Centre, Mount Hutton from 25th to 27th August, 1994. Twenty exhibitors, including two members from A.N.O.S. Central Coast Group, benched 162 plants.

Several large plants of *Dendrobium speciosum* var. *speciosum* and *D. speciosum* var. *grandiflorum* (*D. rex*) were at the centre of the display and filled the air with the perfume that only *D. speciosum* have the ability to.

Grand Champion and Champion Hybrid of the Show was awarded to *D.* Gloucester Sands, a magnificent, large and well grown plant carrying 18 racemes of flowers, owned by Ossie Murray.

Champion Epiphytic Species was awarded to *D. speciosum* var. *curvicaule* (*D. curvicaule*) owned by Bill Skillicorn. The plant displayed two racemes of fully open, well shaped white flowers.

Champion Deciduous Terrestrial Species went to *Pterostylis curta* owned by Keith Buxton. The exhibit comprised of a seedling tray filled to almost overflowing with plants and flowers too numerous to count.

Champion Novice was awarded to Fred Bryant for his 10" pot abundant with plants laden with flowers.

Class winners — showing plant awarded and owner, were as follows:-

- *Dendrobium* Species — Dendrocoryne Section
  - *D. aemulum,* Peter Wilkinson.
- *Dendrobium* Species — Terete Leaf Section
  - *D. teretifolium,* Len Field.
- *Dendrobium speciosum* var. *speciosum*
  - *D. speciosum* 'White', Rick Thompson
- *Dendrobium speciosum* var. *grandiflorum*
  - *D. speciosum* 'Grand Mal', Bill Skillicorn
- *Dendrobium speciosum* — Other Varieties
  - *D. speciosum* var. *curvicaule, Bill Skillicorn*
- *Dendrobium* Species — Other
  - *D. canaliculatum,* Ossie Murray
- Species Seedling (first flowering)
  - *D. speciosum* 'Red Factor A x B', Peter Presland
- Artifically Propagated Species
  - *D. speciosum,* Ossie Murray
- *Pterostylis* Species
  - *P. curta,* Keith Buxton
- *Diuris* Species
  - *D.* aff. *corymbosa,* George Hilton
- *Caladenia* Species
  - *C.* aff. *quadrifaria,* George Hilton
- Other Deciduous Terrestrial
  - *Prasophyllum brevilabre,* Peter Presland
- *Dendrobium* Hybrid — Primary/Classic
  - *D.* Golden Fleck, Jack McMillan
- *Dendrobium* Hybrid — Tetragonum Shape
  - *D.* Quell, Bill Skillicorn
- *Dendrobium* Hybrid — Kingianum Shape
  - *D.* Jesmond Gem, Albert Sherwood
- *Dendrobium* Hybrid — Bifibbum Parentage
  - *D.* Anne's Rainbow, Bill Skillicorn
- *Dendrobium* Hybrid — Other
  - *D.* Northmead, Len Field
- *Sarcochilus* Hybrid — Novelty
  - *S.* Lotus, Bill Skillicorn
- Seedling Hybrid (first flowering)
  - *D.* Lynette Banks, Albert Sherwood
- Australasian Hybrid
  - *D. cucumerinum* x *D. teretifolium* 'Black Pam', Albert Sherwood
- Specimen Hybrid
  - *D.* Gloucester Sands, Ossie Murray

NOVICE SECTION

- *Dendrobium* Species — Dendrocoryne Section
  - *D. aemulum*, Rick Thompson
- *Dendrobium* Species — Terete Leaf Section
  - *D. teretifolium*, Fred Bryant
- *Sarcanthinae* Species
  - *S. falcatus*, Rick Thompson
- *Dendrobium* Hybrid — Primary
  - *D. Xdelicatum,* Rick Thompson
- *Dendrobium* Hybrid — Other
  - *D. kingianum* 'Dianne' x *D.* Aussie Ira, Neville Robin
- Terrestrial
  - *Pterostylis curta*, Fred Bryant

I would like to thank all those who exhibited plants, helped in setting up and manning the show and the A.N.O.S. judges who gave up their time to travel to Newcastle. Thanks also to the management of Lake Macquarie Fair for their assistance with the setting up of a very successful show.

A.N.O.S. PORT HACKING GROUP — SPRING SHOW 1994

Bob Napier

A.N.O.S. Port Hacking Group's Spring Show was held on 11th September, 1994 at the Scout Hall, Oliver Street, Heathcote.

Grand Champion and Champion Hybrid — *Dendrobium* Karloo (Plate 18) owned by Neville Roper.

Champion Species — *D. speciosum* (plate 17) owned by Col Brandon.

Champion Specimen — *D.* Hilda Poxon owned by Neville Roper.

Best Orchid by Novice — *D. Xgracillimum* owned by Greg Wood.

Best Orchid by Junior — *D. Xgracillimum* owned by Grant Wood.

The quality of the plants on show is indicative of the interest being shown by growers in this branch of orchid growing. The colour and texture of the flowers was a feature of the display, which was very favouraBLY COMMENTED ON BY ALL. Public interest was very encouraging and society members were kept busy answering a number of questions.

The show was judged by D. Smedley, R. Wheeldon, D. Barnham and J. Lykos.

A.N.O.S. CENTRAL COAST GROUP — SPRING SHOW 1994

Bruce Murray

The Central Coast Group conducted its 14th Annual Spring Show during the period 8th to 11th September, 1994 at the Australian Springtime Flora Festival which was held in the grounds of the Mt. Penang Juvenile Justice Centre at Kariong.

Two hundred and fifty plants were benched by 18 members and visitors.

Except for a shower on Friday lasting for about 20 minutes, the weather was fine and warm and the sunshine tempted multitudes of people to attend the festival. A great number of these people walked through our show and admired the floral display.

Financially, the show was a success. The raffle, with a prize of a wheelbarrow filled with assorted "goodies" was well patronised. The plant sales counter ran out of stock on Sunday afternoon and Ray Clements of Tinonee Orchids came to the party and provided plants to be sold on commission.

A second sales table, selling species and classic hybrid plants, was conducted by Allan Dash and John Turner. the proceeds of this table were in aid of the group's conservation fund.

The Grand Champion was a pot of 10 superbly grown and well flowered plants of *Caladenia catenata* (Plate 15) owned by John Riley. This exhibit was also judged the Best Terrestrial Orchid.

The Reserve Champion, a large clone of *Dendrobium speciosum* var. *grandiflorum* owned and benched by Reg Burns. This plant was also judged the Best Species Orchid.

The Best Hybrid Orchid was a plant of *D.* nunkumbil x *D. falcorostrum,* owned by Craig Alexander. This plant has been nominated for the Ira Butler Trophy.

The Best Specimen Orchid was a massive plant of *D. speciosum* var. *grandiflorum* owned by Allan Peck.

A plant of *D. kingianum* ('Betty' x 'Purple Beauty') owned by John Simmons was judged to be the Best Species Seedling.

My plant of *D.* Zip x *D.* Kathryn Banks 'Lauren' was judged the Best Hybrid Seedling.

I congratulate these winners, the other Class winners and all who benched plants at the show.

We were honoured to have visitors from other A.N.O.S. Groups. In particular, we were pleased to welcome Rick Winch from A.N.O.S. Western Australia.

John Riley also honoured us with his presence and a display of his terrestrial orchid drawings as well as demonstrating his technique. He also attracted a very appreciative audience and answered their many and varied questions.

Rhizanthella slateri (Rupp) M. Clements et Cribb

Central Coast, New South Wales.

A drawing of one of our two underground orchids by John J. Riley, 25 Woronora Avenue, Leumeah, N.S.W. 2560.

A & B	Plants	to scale X1
C	Plant, view from above	X3
D	Plant, with bracts removed, showing flowers	X3
E	Bract, flattened	X4
F	Flower, side view	X6
G	Flower, front view	X6
H	Lateral sepal, flattened	X6
J	Dorsal sepal, flattened	X6
K	Petal, flattened	X6
L	Labellum, side view	X15
M	Labellum, from above	X15
N	Column, side view	X10
O	Column, front view	X10

This drawing is copyright and may not, under any circumstances, be reproduced without the permission of the artist John J. Riley.

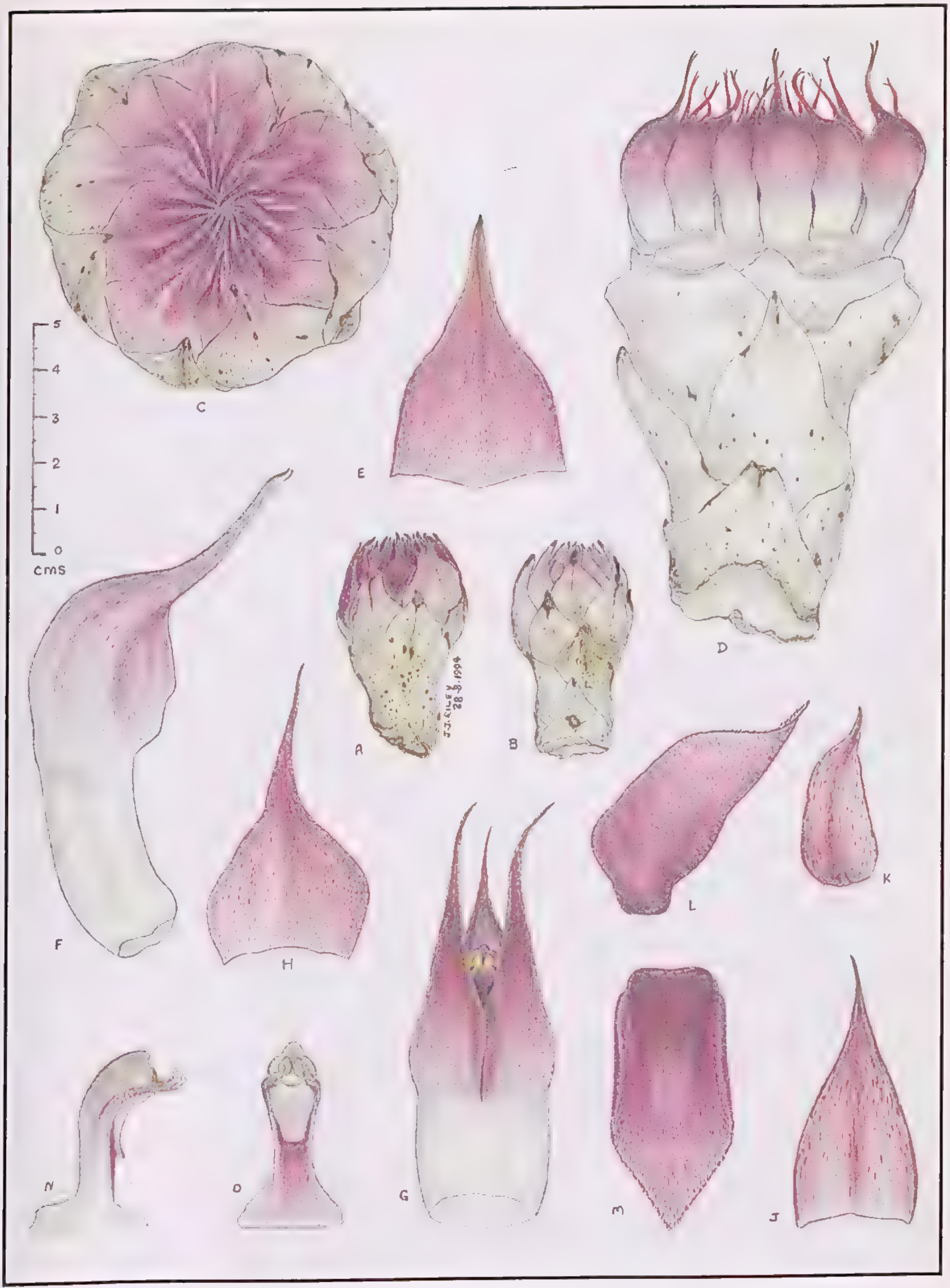

Plate 14: *Rhizanthella slateri* (Rupp) M. Clements et Cribb.

I wish to convey my appreciation to Murray Smith and Hellen Dafter, Show Marshall and Recorder respectively. Others whom I wish to commend for their able assistance are: John Turner, Allan Peck, Gary Sweikert, Allan Dash, Reg Burns, John Simmons, Steve Dunstan, Stan Davis, Robin Elkin, Roma Sterling and Phil Johns. Particular thanks go to Pat Burns and Lois Simmons for their efforts in providing supper after the judging and in selling raffle tickets, also to Jill and Walter Upton for the donation of a copy of Wal's *Sarcochilus* book, the profit from the sale of some other books and their help with the raffle.

We appreciate the invitation from the committee of the Australian Springtime Flora Festival to participate and the provision of a site in their show.

Finally I wish to thank the A.N.O.S. Judges, Jim Lykos, Ian Slade and Jim Walker for their sterling effort in judging our plants under a degree of difficulty with improvised lighting.

A.N.O.S. WARRINGAH GROUP — SPRING SHOW 1994

Ruth Rudkin

Despite the unexpected storms that brought the welcome rain on the day and evening of the setup of the show at the Forestville Memorial Hall, the weather on the Saturday and Sunday was perfect. Visitors were met with the perfume from a wonderful display of our native orchids, which the sunshine brought to perfection.

As usual at this time of the year, the various varieties of *Dendrobium speciosum* lit up the hall and the stage, where six displays had been set up. Bernie Fletcher's *D. speciosum* var. *speciosum* was first in its section and Frank Holberton's *D. speciosum* var. *grandiflorum* (*D. rex*) was first in that section. There were not as many *D. kingianum* entries as in some years, perhaps because of the cold snap. Lyn Smith's small *D. kingianum* ('Speckles' x 'Freckles') may show us the shape of things to come. However the several enormous hanging masses of *D. teretifolium,* covered with flowers, most notably that of Murray Corrigan, took the eye as did quite a good display of *D. Xdelicatum,* particularly the pinks, many probably originating from Erik Webeck's magnificent specimen which once again greeted everybody as they came in the door.

The most successful exhibitor was Erik Leilkajis, with nine prizes, two medals and a ribbon and the proud owner of *Peristeranthus hillii* (Plate 16), with eight perfect racemes, which won its section, Champion Epiphytic Species, Champion Specimen Plant and Grand Champion of the show and will be nominated for the Bill Murdoch Trophy. A small plant with lovely golden flowers in the winning display of David Butler and Bernie Fletcher, *Dendrobium* Yondi Gold (Plate 19), was Champion Australian Native Hybrid and will be nominated for the Ira Butler Trophy. The Champion Australian Native Terrestrial Orchid was Ray Young's pot full of *Caladenia carnea* that was set in the winning small display he set up with Peter Eygelshoven. Another noticeable orchid was the winner of the Native Hybrid with tetragonum shape, the vibrant orange *D.* Aussie Aurora 'Sunrise' of Bernie Fletcher. High at the back of the display by Bill Dobson and Ron Gallaher was a large pure white *D. Xdelicatum* of Joan Petith's which was judged the Champion specimen Hybrid. The winning non-Australian species was Terry Carter's *D. laevifolium* with its attractive purple-pink flowers.

Not often seen at Sydney shows was Erik's *Bulbophyllum blumei,* with one flower, its reddish purple dorsal sepal dropped for the evening and the two long thin lateral sepals twisted around each other. Although this species was initially found in Java it is also in Papua New Guinea and north Queensland. Another of Erik's plants was a *Dendrobium canaliculatum* var. *foelschei* from western Queensland, Northern Territory and the Kimberleys, with flowers smaller than the common *D. canaliculatum,* on four or five perfectly arching racemes.

Plant sales have always been popular at Warringah Group's Shows. On Friday night the sales tables were loaded with plants, but by Sunday afternoon Mick Korzonowski and his many assistants had little left to sell. The raffle prizes, some first rate plants donated by Neil Finch, kept Bill Westwood and his ticket sellers busy during all the weekend.

The really outstanding event of this show was the 30th Anniversary Dinner held in the adjacent hall which has a connecting passage to the main hall. This meant that guests could wander into the show at any time — a great idea. In addition to our present patron Wal Upton, we welcomed our former patron Hermon Slade and our former members Phil and Yvonne Spence and two children. Murray Corrigan, a foundation member, was our very able M.C. Wal, our first president, gave us a short history of the group and with Murray and ex-president Barry Collins enlivened the evening with amusing stories. Among the guests both at the show and the dinner, were Rick Winch from Busselton, Western Australia, a student of the Western Australia Judging Course and Steve and Betty Meszaros of the Native Orchid Society of South Australia. Our worthy treasurer for the 30 years, Joan Cook, was greatly surprised by the presentation to her of a beautiful framed tapestry depicting *D. bigibbum* flowers. Our new badge was on sale and the raffle prize was a silver badge No. 1, won by Joan Petith. After a very good evening we each went home with a wine glass emblazened with our logo, *Caleana major.*

At the close of the Show, the president Mick Korzonowski, thanked those from other A.N.O.S. Groups who supported us — Neil Finch from Newcastle, David Butler and Bernie Fletcher from Sydney and John Andrews from Central Coast. The success of the show was due firstly to the work of the Show Committee led by Chris Arnott and Terry Carter, the large number of ordinary members too numerous to mention who gave their time setting up the Show, selling tickets, Joan Cook and others welcoming visitors at the door, manning the sales table, cleaning up afterwards and the caterer Bill Lowe and his assistants who did a stirling job both at the Show and the dinner. Above all thanks are due to all those members who brought their plants without which there would not have been a Show at all. ✾

AROUND THE GROUPS

At a recent exhibition of paintings by the Wildlife Art Society of Australasia, Helene Wild the Editor of the Victorian Group's Bulletin and one of our valued painters of native orchids, many of which have appeared in *The Orchadian,* won the much coveted Society For Growing Australian Plants Award for her painting "*Dichondia repens* Amongst Basalt". Congratulations Helene on a well deserved award. Although the subject of the painting was not an orchid but a member of the family *Convolvulaceae* it proves that our artists are equally proficient in all phases of art.

In the spring 1994 issue of Wildlife Australia is an article depicting native orchid paintings by Louise Saunders of Queensland. Another of our valued artists, her paintings appear in this issue.

Incidentally both Helene and Louise sell their beautiful paintings of Australian Native Orchids. Should any of our members be interested please write to them, their addresses appear frequently in *The Orchadian.* All paintings by our artists are copyright and may not, under any circumstances be reproduced without the permission of the artist.

In the August 1994 issue of *Your Garden* is an article on Phillip Spence, a Sydney Group member, entitled "Aussie Orchid Triumph" and refers to his hybridising of cool growing New Guinea dendrobiums, particularly those of the *Latouria* section, with our Australian native dendrobiums.

In the October, 1994 issue of *Your Garden* is an article by A.N.O.S. Victorian Group entitled "Orchids for Everyone". This portrays the native orchid hybrid with a blend of tropical and cold growing characteristics and explains how these can be grown in southern regions if a few simple requirements are provided.

A.N.O.S. — NORTHERN REGIONAL COUNCIL

The second meeting of the Northern Regional Council took place at Maryborough on 9th July, 1994 — 12 delegates and 12 observers, representing seven Groups and Societies attended.

The main points gleaned from a report on the meeting were:–

Council to meet four times per year — initially full delegate meetings, but when fully set up, one full delegate meeting and three telephone hook-ups per year.

Funding — Council to take up offer by A.N.O.S. National Council for $2 for each Orchadian subscriber in Queensland. Five Groups have forwarded initial $30 levy to date.

Council's Role — Council will take over Judging Panel in Queensland.
Wide Bay will be the next area to have judging classes.
Council to circulate information to all Groups on the various activities taking place.
To circulate a list of guest speakers, slide programmes, etc.
A formal conservation policy is being developed.
Groups are to be asked to improve information flow between each other.

General Business — Council to be incorporated.
Ideas for the Council's emblem for the next meeting.
Proposed amendments to the Flora and Fauna Act is being considered; when the next draft is released a special meeting will be called, if necessary.
A list of available seed of rare and endangered species to be prepared and forwarded to groups in an endeavour to conserve species. ✻

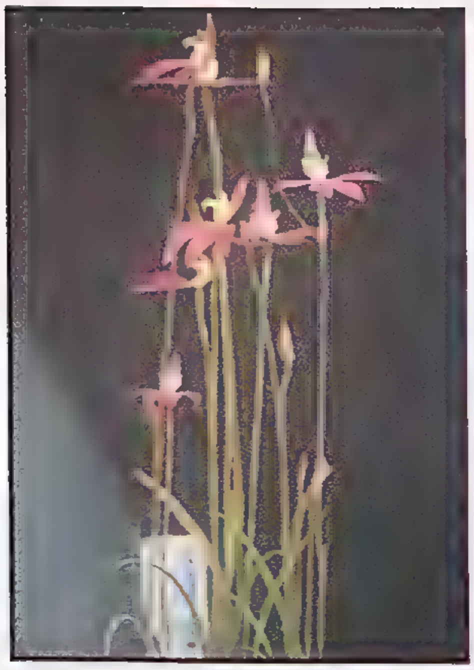

Plate 15: *Caladenia catenata.*
Photo: J. Turner.

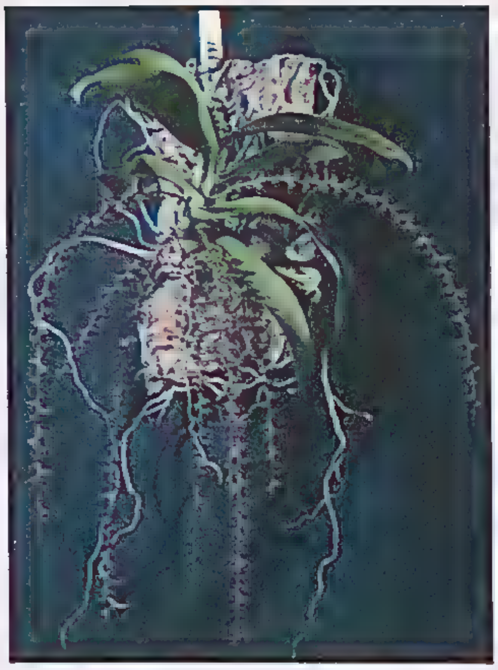

Plate 16: *Peristeranthus hillii.*
Photo: D. Titmuss.

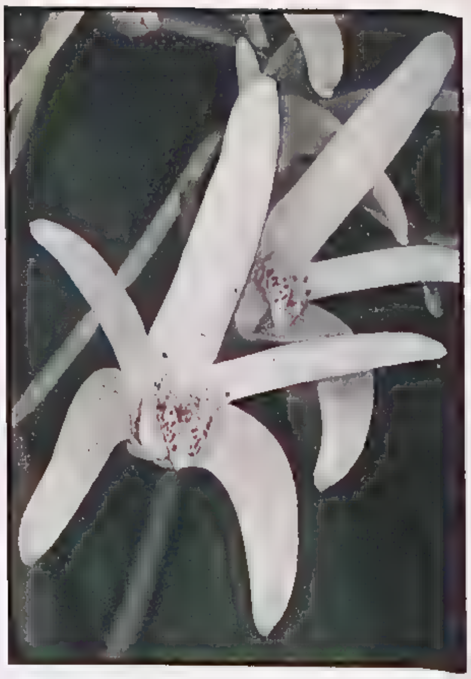

Plate 17: *Dendrobium speciosum.*
Photo: R. Napier.

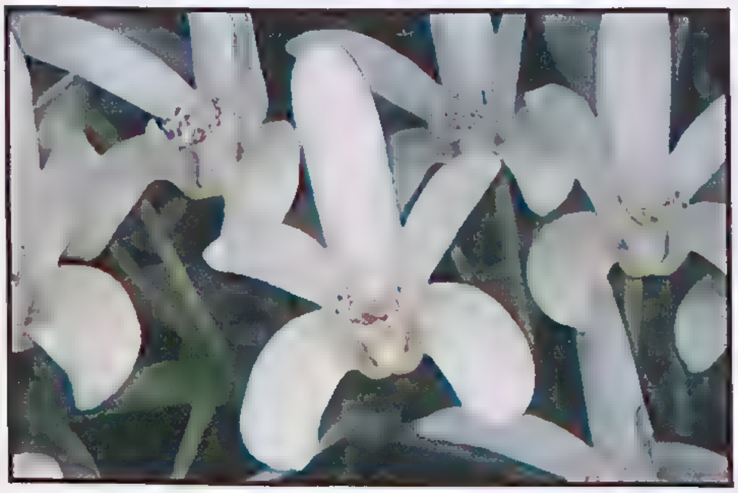

Plate 18: *Dendrobium* Karloo. Photo: R. Napier.

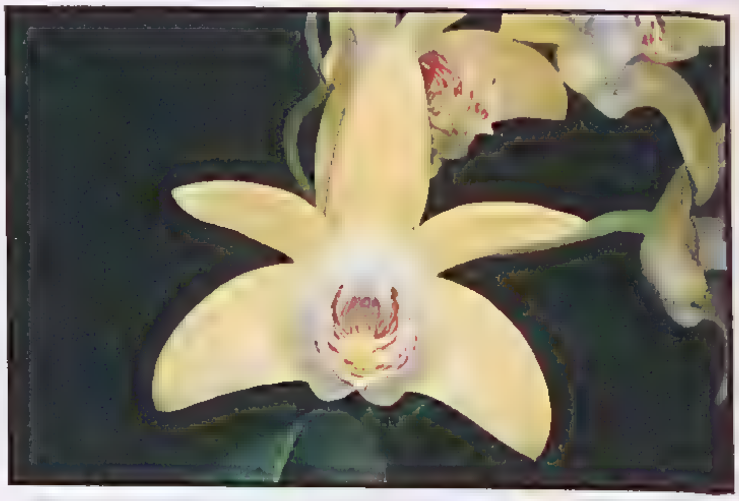

Plate 19: *Dendrobium* Yondi Gold. Photo: D. Titmuss.

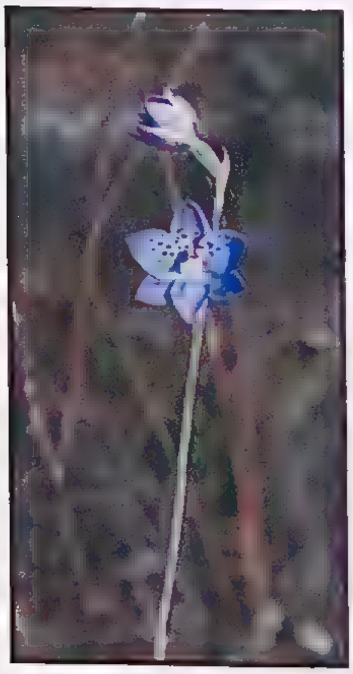

Plate 20:
Thelymitra aff. *ixioides.*

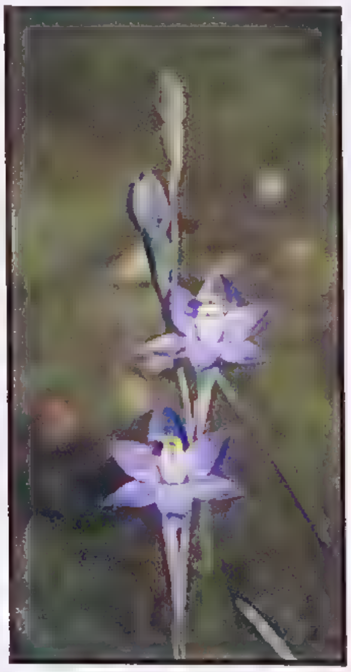

Plate 21:
T. aff. *pauciflora.*

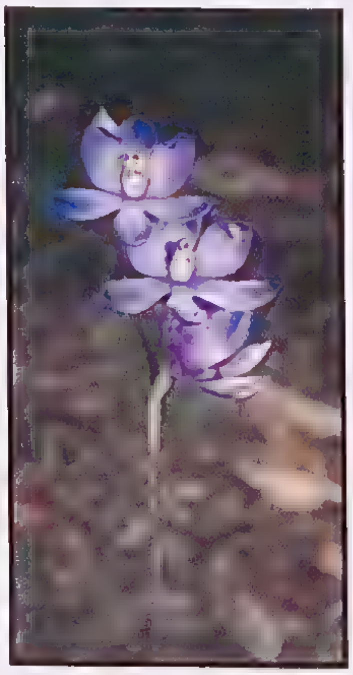

Plate 22: *T. nuda.*

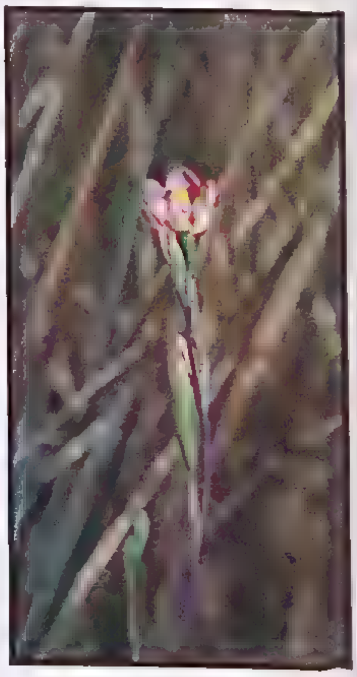

Plate 23: *T. rubra.*

Photos by S. Cudmore.

FOUR *THELYMITRA* SPECIES FOUND GROWING ON BLACK MOUNTAIN, A.C.T.

Sheila Cudmore
10 Nangor Street, Waramanga, A.C.T. 2611

Thelymitra aff. *ixioides* (Plate 20) is a blue, spotted sun orchid found growing in damp soil in open forest. The flowers open freely on warm sunny days in November. It is an undescribed species differing from true *T. ixioides* in column details and has a smaller flower.

Thelymitra aff. *pauciflora* (Plate 21) is a plain blue sun orchid found growing in a range of conditions from dry soil in very open forest to quite moist conditions. From my observations it is the most common sun orchid on Black Mountain. It also needs warm, sunny, late spring days to open.

Thelymitra nuda (Plate 22) is a bigger (than the two previous orchids) blue sun orchid found growing in quite bright light under trees, in sandy soil which does get quite wet at times. The flowers of this orchid open on sunny, warm, humid days in late spring and early summer.

Thelymitra rubra (Plate 23) a small pink sun orchid grows in very open forest in extremely moist soil, even in the drought the soil is still slightly wet under the moss and short thick grass that grows on it. The flowers of this orchid are very shy about opening. My husband and I rushed up with the camera on many warm sunny days of early summer hoping to get a photo, with no luck. We even took our lunch up there with the intention of sitting and waiting — no luck. It was a few runs later that we eventually did get our photo on a warm humid sunny day in early December. The humidity came from the moist soil (a microclimate) as Canberra is normally a dry city. Just below the area where *T. rubra* grows is a creek, which is dry in the drought we are having.

As can be seen from this article, we can see the flowers of *T.* aff. *ixioides* and *T.* aff. *pauciflora* every year. *T. nuda* can be shy and we are very lucky to see *T. rubra* open. The Orchid Society of Canberra has published a book on growing orchids in Canberra with a chapter on seasonal orchid walks which explains where and when some of these sun orchids can be found.

ACKNOWLEDGEMENT

Thank you to Dr Ben Wallace of the Australian National Botanic Gardens, Canberra for help in identifying the plants.

BOOK REVIEWS

FIELD GUIDE TO THE ORCHIDS OF COSTA RICA AND PANAMA

By Robert L. Dressler

Published by Cornell University Press, Sage House, 512, East State Street, Ithaca, New York 14850

229mm x 156mm, 374 pages. Published simultaneously in cloth and paper. 240 superb colour photos, 229 line drawings.

ISBN 0–8014–2582–4 (cloth) $US60.50.
ISBN 0–8014–8139–2 (paper) $US38.50.

As many of our members are most interested in all orchids, I am reviewing another book on exotic orchids, this book is a well engineered field guide, from which we can all learn more about the orchid family as well as the orchids of Costa Rica and Panama specifically.

All the keys to the genera of the various subtribes are excellently illustrated by drawings depicting the difference in each division of the key. The keys to the individual species are easily understood.

Chapter 1. The Area: Geography, Climate, Vegetation and People. This is a great insight into the area.

Chapter 2. Orchid Structure and Ecology — is treated in much detail, particularly pollination.

Chapter 3. Classification and Identification — outlines the classification of the orchids of the area and then explains how to use the field guide.

Chapters 4 to 10 give excellent keys to the various subtribes involved. Firstly the key leads us to the genera in the subtribe, then on to a general key to the genus and finally the species within the genus. These chapters make it quite simply to identify each species. This book is a fine example of a very helpful and informative field guide.

The generic and specific descriptions are compact and the major characteristics stand out, making identification reasonably simple.

The colour photographs are quite natural and are a further aid to the recognition of the species when looked at in conjunction with the keys.

This is a book well worth having on the bookshelf for future reference.

Walter T. Upton

LETTER TO THE EDITOR

16 Sharon Street
Doncaster, VIC. 3108

14th August, 1994
Dear Wal,

Could you kindly publish the following information in *The Orchadian* concerning the parentage of *Dendrobium* Anne's Rainbow and other hybrids that I have made using the same pod parent. After much discussion with Phil Spence, Bill Skillicorn and John Woolf and comparing photographs and slides of *D.* Aussie Angel and *D.* Colonial Surprise it has now been established that the correct pod parent of *D.* Anne's Rainbow is *D.* Colonial Surprise and NOT *D.* Aussie Angel as originally stated. [Ed.—See Corrigenda page 266]. We have advised the R.H.S. Registrar of Orchid Hybrids about this and it will appear as a corrigenda in due course. In fact a correction concerning another hybrid, *D.* Jonathan's Glory has already been published.

Therefore any hybrids that have come from Florafest Orchids or myself with the pod parent stated as *D.* Aussie Angel should be changed to *D.* Colonial Surprise.

The error was due to some confusion in reading the label on the original flask of seedlings that I procured from Phil Spence and I tender my apologies for any resulting inconvenience caused. By publishing this information we hope to set the record straight as we are aware that some of these hybrids are already being used as parents.

The hybrids concerned are:–
D. Colonial Surprise x *D. speciosum*
D. Colonial Surprise x *D.* Kingrose
= Jonathan's Glory
D. Colonial Surprise x *D.* Lorikeet
D. Colonial Surprise x *D.* Star of Gold
D. Colonial Surprise x *D.* Aussie Child
D. Colonial Surprise x *D.* Hilda Poxon

Yours sincerely,
Issy Klein

BACK COVER

The painting by Louise Saunders on the back cover is a selection of native orchids from south-eastern Australia and depicts the following species — from left to right:–

Pterostylis foliata, Caladenia fuscata, Orthoceras strictum, Caladenia caerulea, Microtis unifolia, Chiloglottis cornuta, Pterostylis alata, Corybas diemenicus, Diuris maculata, Pterostylis hamata, Caladenia phaeoclavia, C. testacea, Corybas incurvus, Thelymitra nuda, Caladenia cucullata, Diuris punctata, Pterostylis nana, Diuris lanceolata, Chiloglottis valida, Pterostylis revoluta, Calochilus robertsonii, Thelymitra cyanea, Dipodium roseum, Diuris corymbosa, Cyrtostylis reniformis, Pterostylis furcata, Dipodium hamiltonianum, Caladenia rigens, Thelymitra ixioides, Caladenia carnea, Pterostylis longifolia, Corybas fordhamii, Thelymitra rubra, Glossodia major, Thelymitra antennifera, Gastrodia procera, Pterostylis pedunculata, Prasophyllum suttonii, Caladenia deformis, C. menziesii, Pterostylis parviflora, Caladenia lyallii, Caleana major, Pterostylis nutans, Caladenia patersonii.

POSTER

A delightful poster 84cm x 60cm portraying a painting by Louise Saunders of the Orchids of the north-east of Victoria is available from the Department of Conservation and Natural Resources, Post Office Box 124, Benalla, Vic. 3672, at a cost of $5.00. The painting depicts the following orchids in full colour:–

Caladenia gracilis, Pterostylis nana, Thelymitra pauciflora, T. rubra, Caleana major, Caladenia praecox, Prasophyllum odoratum, Thelymitra ixioides, Cyrtostylis reniformis, Diuris lanceolata, Microtis unifolia, Pterostylis longifolia, P. curta, Diuris punctata, D. sulphurea, Caladenia caerulea, Pterostylis revoluta, Thelymitra nuda, Caladenia cucullata, Pterostylis parviflora, Diuris maculata, Calochilus robertsonii, Pterostylis nutans, P. pedunculata, Glossodia major, Thelymitra holmesii, Eriochilus cucullatus, Caladenia carnea, Prasophyllumm rufum.

THE 31st ANNUAL GENERAL MEETING OF A.N.O.S. INC. HELD AT THE GOSFORD R.S.L. CLUB ON 6th AUGUST, 1994

R. G. Napier
12 Laguna Street
Caringbah, N.S.W. 2229

As in 1993, A.N.O.S. Central Coast Group hosted the 31st Annual General Meeting at Gosford attended by 45 members, the largest attendance since 1990 at Stony Range when the A.N.O.S. Rules were approved prior to our incorporation. The larger than usual attendance was due mainly to several Council positions being contested, an unusual occurrence. Welcomes were extended to interstate members and delegates — Gerry Carne, Ron and Gwen Robjohns from N.O.S.S.A., Kevin Cummins from A.N.O.S. Geelong, Don Smith from A.N.O.S. Victoria and from A.N.O.S. of Western Australia Neville Risbey and G. Doherty.

The A.G.M. was opened by retiring President, Barry Collins who congratulated N.O.S.T.I. for the successful hosting of the 2nd Australasian Native Orchid Conference and Show in Toowoomba in September, 1993 and touched on progress with the 3rd Conference and Show scheduled for 1996 in Adelaide to be hosted by N.O.S.S.A. A.N.O.S. Macarthur Group under John Riley is taking on a planting of our terrestrial orchids at Taronga Park Zoo; the Judging Course is progressing well, a panel is up and running in Queensland led by John Hazelwood and there is a promise of panels in S.A. and W.A. *The Orchadian* continues to be our flagship thanks to the untiring efforts of Wal Upton and his helpers on the Central Coast. Barry paid tribute to Michael Harrison who, because of family and work commitments was unable to continue on Council.

The Treasurer's Report emphasised a continuing improvement in our finances, with the Conservation account up by some $1,400 thanks mainly to the Tuberoid Bank run by Macarthur's Richard Hanman and a turnaround of over $1,200 in the Judging Panel's finances.

We were able to repay the A.O.F. Grant of $2,500 made several years ago and make our $1,000 sponsorship of the Grand Champion at the 3rd Conference and Show without depleting our reserves unduly. The Society's Financial Statements as presented to the A.G.M. and submitted to the Department of Consumer Affairs are published elsewhere in this issue.

The Editor reported continued "on time" production of *The Orchadian* and thanked all concerned in the production of the journal, but stressed that more contributions especially cultural articles are required. Later in the meeting he indicated that this coming year will see the completion of his 3rd year as Editor and the end of his self-imposed term of office.

Alan Dash presented the Conservation Report touching on the Great Ocean Road in Victoria, the N.S.W. N.P.W.S. impending policy on tagging and the success of the Tuberoid Bank plus the possibility of flasking of *Pterostylis gibbosa* by John Larkey of Newcastle for distribution by Richard Hanman of Macarthur.

Jim Lykos presented the Judging Panel Report on behalf of D. Smedley, Acting Registrar.

The Chairman then declared all positions on Council vacant and passed control of the meeting to Murray Corrigan who conducted the Election of Office-Bearers and Councillors. After proxies were validated and allocated a number of nominations were withdrawn; a ballot then took place for Councillors only, there being eight nominations for seven positions. Names of the A.N.O.S. Office-Bearers and Councillors appear at the front of this issue.

The new President (recycled from 1971) then took the chair. Brief reports were given by Group representatives present with a detailed rundown on progress with the 3rd Conference and Show by Gerry Carne, N.O.S.S.A. Secretary and Conference Chairman.

The advisory Committee Meeting opened at 1.50pm, chaired by Barry Collins.

A submission by A.N.O.S. Central Coast Group regarding a restructure of A.N.O.S. Council with N.S.W. Groups appointing Council members was discussed. Several problems were highlighted, disenfranchising private non-group members, possible exclusion of able people from Council if their Group's "quota" is filled and open-ended numbers of members on Council to match new Groups. The general feeling was that progress toward a national council is possible and a sub-committee has been formed to investigate and report to Council with firm proposals. It was resolved that copies of the A.N.O.S. Rules be distributed to all members.

Murray Corrigan moved that Walter Upton be invited to become patron of the Society, seconded by Michael Harrison and carried unanimously. Wal Upton accepted the position.

Our thanks go to Bruce Murray, President of Central Coast Group for organising the venue for the A.G.M. and to other members of the Group for making all the visitors welcome, especially John and Yvonne Turner for their hospitality at the after meeting barbecue.

Our next A.G.M. will probably be hosted by Warringah Group, it will be difficult to match the facilities at Gosford.

Thanks again, Central Coast.

✻

AUSTRALASIAN NATIVE ORCHID SOCIETY INC.

Statement of Receipts and Expenditure for year ending 30/6/1994

RECEIPTS	$
The Orchadian – Subscriptions	20,113.00
– Colour Fund	920.00
– Sales of Back Issues	1,253.00
– Advertising	1,490.00
– Postage	20.00
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Family Member Fees	60.00
Conferences 1st – Sale Badges	83.00
– Sale Proceedings	255.00
2nd – Sale Badges	150.00
– N.O.S.T.I. Trust Fund	2,000.00
Conservation – Badge Sales	1,775.00
– Tuber Bank	557.75
Judging Panel – Donations	527.50
– Judging Course	1,125.00
– Award Certificate Fees	120.00
– Book Sales	190.00
Sales Items – Hybrid List	2,038.50
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– John Riley Prints	80.00
– A.N.O.S. Badges	155.00
– A.N.O.S. Medallions	360.00
– Posters	19.00
– W.A. Book	42.00
Advance Payment for goods, badges	117.00
Bank Interest	387.20
Donations	75.00
Photocopying	2.50
Exchange Cheques	372.00
Postage	78.39
	34,853.84
Unpresented Cheques 1993/94	14.94
Opening Cash in Bank 1/7/1993	15,223.07
	$50,091.85

EXPENDITURE	$
The Orchadian – Refund Subscriptions	72.00
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– Refunds Back Issues	20.00
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– Editorial Expenses	386.33
Repayment of A.O.F. Grant	2,500.00
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– Payment John Riley	80.00
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Donations	303.00
Photocopying	276.15
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Postage	569.50
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Unpresented Cheques 1992/93	60.00
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We also have $6,762.78 in F.T.D. Account with A.N.Z.

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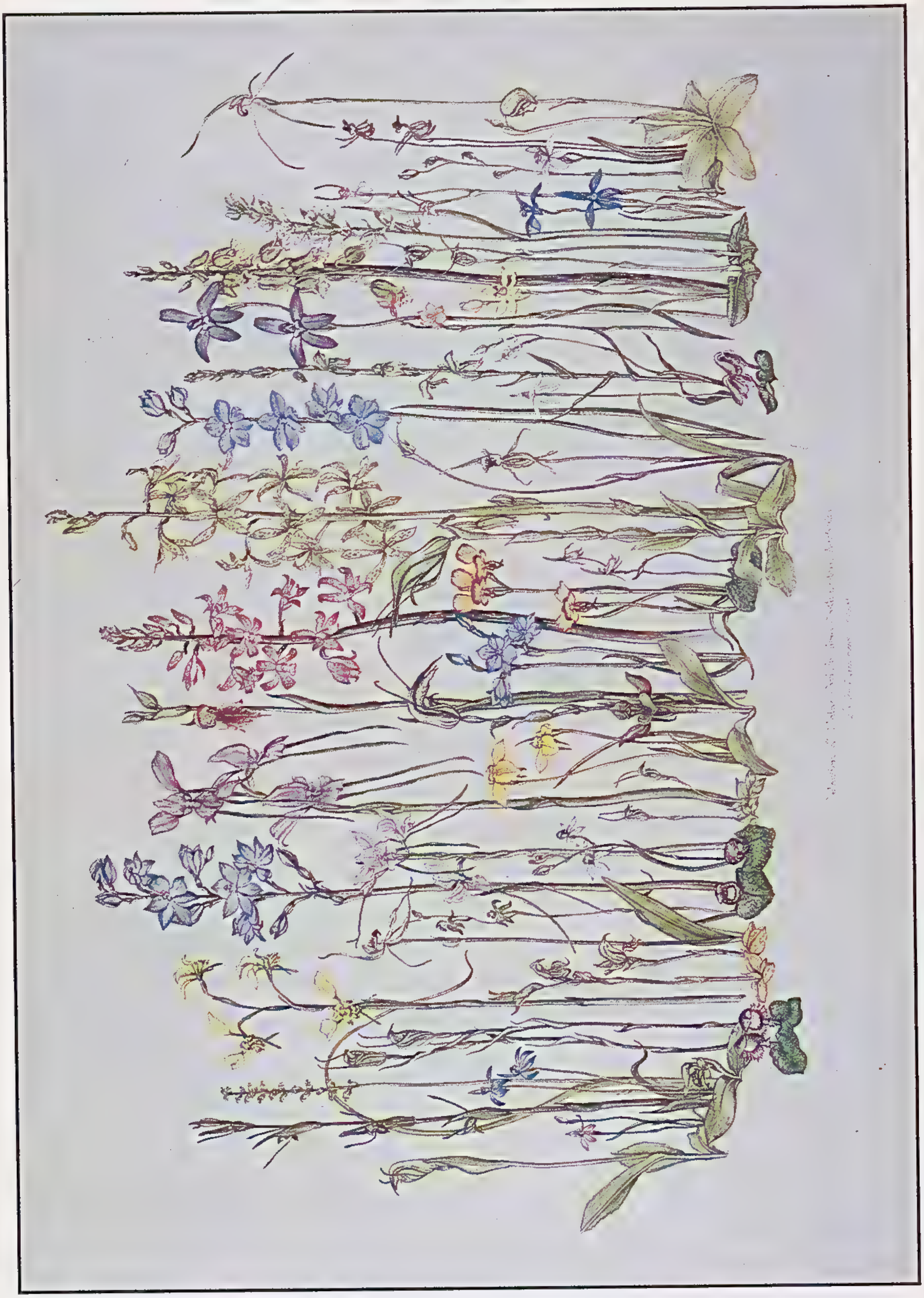

Plate 24: A selection of native orchids from south-eastern Australia. A painting by Louise Saunders – 1994. (See page 282)

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The Orchadian

Volume 11, Number 7

March, 1995

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TALKING POINT

It is very pleasing to have, in this issue, an article by Australia's leading native orchid authority, Alick W. Dockrill; it is many years since he last wrote for us. His words of wisdom should be read by all.

Another milestone is created in this issue; for the first time it consists of 64 pages and I still have a few articles left over towards the next one. Perhaps, if you keep the articles coming and the content well balanced, we can continue with this number of pages. Of course, to do this we need to increase our membership, so that we can afford a bigger and better journal. More articles on the culture of our precious native orchids are needed, those down to earth articles with much basic information, the kind of knowledge expressed when we brag about our expertise in the culture of our plants.

The scientific article "A Reinstatement Of *Rhomboda*" by Paul Ormerod was refereed by Jeffrey Wood of Kew. It covers all species now referred to this genus, not just those from our area. Many years of research have been undertaken by Paul including numerous visits to herbaria both here and overseas. Sorry I had to divide Roy Gifford's *Liparis* article into two parts but I did not feel I could go to more than 64 pages this time.

Sarcanthinae orchids are becoming more popular as the years go by, so they feature quite a lot in this issue, represented by no less than 19 colour pictures.

Our allegiance or fondness for particular aspects of our hobby has assuredly changed over the years, once it was certain species that caught our eye, at another time it was a craving for *Dendrobium* hybrids, then species lost their popularity, now they are back at the top and *Sarcanthinae* species and hybrids are taking over in many areas. Terrestrials are gradually progressing to a more prominent position. Of course, climatic conditions hold great sway over collections. What a fascinating hobby and how lucky we are in Australia to have such a varied and unique orchid flora.

Your attention is drawn to Tony Slater's article on virus in native dendrobiums on page 313.

May 1995 be a good year for all our members.

Our sympathy to Gerald McCraith, President of the Australian Orchid Foundation, on the sudden death of his most supportive wife, Nell, on 17th February, 1995.

Walter T. Upton

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SOME THOUGHTS ON TAXA AND TAXONOMIC CATEGORIES (PARTICULARLY SPECIES) OF ORCHIDS

Alick W. Dockrill
P.O. Box 127, Atherton, Qld. 4883

There has been a long history of controversy over interpretations and circumscriptions of taxa and taxonomic categories of orchids. There are, as pointed out by R. and M. Schmid 1977 "no positive or useful fossil records" to guide us in these matters so that the very interpretations of taxa, categories and their circumscription are the **opinions** of authors and such things as the recognition of a species, the break up of a species or elevation or lowering of status are based on "careful consideration" which may be in the form of calculated guesswork, presumption, supposition or intuition, virtually amounting to saying that things **are** so and so or correct because we say they are. One of the advantages of botany is that we are **not** bound to follow anyone, there is no such thing as absolute correctness, whether the matter has been published or not. Alternatives are often available for us to choose from or we can make up our own minds. Despite everything mentioned above it is a human trait to want to prove things or allocate our ideas and opinions to nice neat little pigeon holes in our minds and in line with this thinking, in recent times some well meaning orchidologists and botanists have endeavoured to arrive at a criterium or set of criteria by which it can be proved that a particular group (or taxon) of plants constitutes a species. However, once again these criteria are only of paramount importance if we think they are, it is very doubtful that they can be proven to be so.

Some of the criteria suggested, and put into practise, are whether, with the plants in question, there is pollinator specificity, whether habitat specificity, whether geographic isolation, what type of coating there is on seeds, what type of stomata there are in the leaves and so forth, all of which **sound** very learned.

With regard to pollinator specificity, P. B. Adams et al 1992 and 1993 and T. Bartareau 1993, 1994 and in a manuscript submitted to the *The Orchadian* for publication in 1995 have shown that this is **not** a reliable guide and plants in a given population may be pollinated by several species of insect provided they are of suitable size and shape and seek similar rewards or even purely by chance. Also the same species of insect may pollinate a number of species of plant both orchid and otherwise.

Although most species of orchid do seem to **prefer** a particular habitat, they can be found in quite unexpected places and every experienced collector is familiar with the adage "orchids are where you find 'em".

Geographical isolation is a term open to almost unlimited interpretation but one should not lose sight of the fact that orchid seeds are minute and could be transported great distances by wind or water or accidentally by animals. On the other hand, climatic changes, effecting changes to the environment, could quite conceivably isolate populations of the same taxon.

With regard to such things as seed coat and stomata of leaves, surely unless criteria separating taxa and categories can be readily observed by the naked eye or at most a hand lens, it is a bit much to accept the criterium as feasable.

One thing that has been shown by **available evidence** to be true is that over the millenia there have been many fluctuations in our climate, resulting in considerable and fluctuating changes to the environment in particular locations (refer A. P. Kershaw 1986). As a result of these changes, plants have had to either restrict their distribution to very limited suitable situations or, as with very successful species which have a wide distribution, been lucky enough to produce sufficient variations to flourish under a wide variety of conditions. This is virtually tantamount to saying that a successful species has to be inherently variable but it does not mean, as some would have us believe, that a plant has the reasoning power and/or ability to produce the required variation in response to a particular stimulation.

An analogous situation to that mentioned in the last paragraph exists in the animal kingdom, our own species. Fluctuations in climate, such as ice ages, thousands of years ago allowed some of our ancestors to reach "far flung corners of the earth" and, when the climate again changed and the people decided to stay, they had to adapt to widely differing situations such as rainforest, desert, arctic waste, isolated islands, etc. and such races as negros, eskimos, asiatics, caucasians, etc. evolved, each outwardly considerably different from the other, with a different lifestyle and living on different foods. A book could be written about differences Tommy Johnston and Billy Smith yet both are of the one species.

It would seem therefore, that it is incumbent on us to accept a rather broad than narrow species interpretation and, when comparing populations, consider similarities as well as differences. Obvious examples of species calling for a broad interpretation are *Dendrobium speciosum* Smith, *D. tetragonum* Cunn., *D. teretifolium* R.Br., *D. canaliculatum* R.Br. and *Sarcochilus hartmannii* F. Muell.

With genera the taxa are **not** always readily recognisable and, whether we like it or not, their interpretation is sometimes purely intuitive. For example with *Sarcanthinae* the differences between some genera are quite trivial when compared with, say, *Dendrobium* in the broad sense, where groups with gross plant differences and flower structure are lumped under the one genus. Strangely enough, in the past when groups were broken away from *Dendrobium* and given separate genus status, it was more on the basis of flowering habit than flower structure yet four very major structural groups stand out in *Dendrobium*:–

(a) plants in which the leaf-bearing axes are swollen and fleshy, at least in part, and the sides of the claw of the labellum joined to the sides of the column foot, thereby forming a nectary;

(b) plants more or less similar to those of "a" but the labellum joined to the apex only of the column foot and there is no nectary;

(c) plants which have elongate, non-fleshy, leafy leaf-bearing axes;

(d) plants which have rhizome-like or wire-like leaf-bearing axes and fleshy, generally elongate leaves.

A breakup of the genus was carried to extremes by Brieger in 1981 but it did not find general acceptance. A more moderate breakup, perhaps along the lines suggested above is likely to occur at some future date. It is also possible that *Bulbophyllum* will come in for breakup consideration at some future date.

With subspecies groupings, interpretations are far from unanimous. Undoubtedly and understandably horticulturalists are greatly concerned about labelling all manner of variations but, thereby, they often come in conflict with botanists who realise that many of the variations are but very minor variations of an inherently variable species. The category of subspecies is a very popular grouping these days but it is often rather loosely applied. Undoubtedly there **are** obvious subgroups within groups but it is not always easy to be sure of which is the major and which the minor of the subgroups, or which was derived from what, is often a matter of conjecture. As the nomenclatural type group of a species may not necessarily be the main group within the species, much confusion can arise. The term "variety" on the other hand, implies "variation of" and it would not matter which was the major or which the minor group, the term "variation of" would still make sense. Accordingly, and I fully realise that this may not please everyone, I prefer to use the term "variety" for all subspecies taxa.

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There seems to be frequent misunderstanding and misuse of the terms "a sibling" or "a sibling cross" amongst orchid growers and many commercial nurseries.

Siblings in biology (not just in botany) are the offspring of one set of parents. In human terms they are brothers and sisters. In plants this means that the plants have the same seed parent and pollen parent. (In most cases they are raised from the same seed pod).

When the term "a sibling cross" is used, it means a cross between two plants that have exactly the same parents. It doesn't mean a cross between two plants that simply belong to the same species or variety.

Most misuse of the term seems to be the latter. Crosses between plants from different geographical locations are often described as sibling crosses. Crosses between selected seedlings (with distinctly different parents) are also described as a sibling or a sibling cross. These two examples are in fact intra specific crosses not sibling crosses. A suitable description would be "a cross between two selected seedlings" or "a cross between two selected clones from . . . areas".

Even crosses between plants from the same area are not sibling crosses as it is most unlikely that any two individual plants came from the same seed pod.

Sibling crosses are frequently used in inbreeding when a desired parent plant is self sterile. They may also be used to try to bring out recessive characteristics. If used too frequently they often lead to problems with fertility and reduced vigour. However inbred strains often show exceptional vigour when different strains are crossed (e.g. so called hybrid corn).

For definition of sibling(s) see:–

Thomas, C. L. (Ed.) (1973). *Tabers Cyclopedic Medical Dictionary.* F. A. Davis Co., Philadelphia.

Richards, A. J. (1986). *Plant Breeding Systems.* Unwin Hyman, London.

or most biological text books.

SUNDAY, 21st MAY, 1995

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EXPANDING THE COLOUR RANGE WITHIN THE COOL GROWING AUSTRALIAN *SARCANTHINAE*

David P. Banks
Hills District Orchids
39 Carole Street, Seven Hills, N.S.W. 2147

Great advances have been made over the past five years in developing fresh hybridising lines within the genus *Sarcochilus* and the introduction of related genera such as *Plectorrhiza* and *Rhinerrhiza*. Many of these plants have unusual and unique colours that can enhance mainstream *Sarcanthinae* hybrids.

Most of the *Sarcochilus* hybrids in collections basically are combinations which include one or more of the lithophytic species such as *Sarcochilus hartmannii, S. fitzgeraldii* and the pink *S. ceciliae* or its darker relative — *S. ceciliae* subsp. *roseus* (*S. roseus*).

These hybrids are very easy to cultivate in pots of a course mixture. We use a mix of 2 parts medium grade treated pine bark, 1 part of pea size gravel and a handful of perlite. They can be grown in a simple shadehouse, but will often grow a lot stronger if grown in a cool glasshouse or at least a shadehouse with a fibreglass roof. They appreciate at least 70% shade. In fact many growers utilise two layers of this during the warmer months.

The lithophytic species generally have round flowers with wide segments and apart from the delightful Orange Blossom Orchid — *S. falcatus* — most of the epiphytic species have been largely ignored.

I believe there are two main reasons for this:-

- the other species with the "classical" shape (e.g., *S. hillii* and *S. minutiflos*) have quite small flowers.
- some of the more colourful species such as *S. australis* and *S. dilatatus* can be difficult to cultivate and don't have the round shape that our judging system tends to prefer.

The species that have been responsible for the dark colours have varying degrees of brown in their flowers. When these are crossed with pink flowers or flowers with colour in the centre (such as *S. fitzgeraldii* and the Numinbah Valley forms of *S. hartmannii*) the colour is intensified.

The lithophytic species still have a very important part to play and some bright colours have been seen in hybrids such as *S.* Cherie (*S.* Fitzhart X *S. fitzgeraldii*), *S.* Melody (*S.* Melba X *S. fitzgeraldii*) and *S.* Pinky (*S.* Mavis X *S. hartmannii*). These lithophytic species also impart vigour to their progeny.

The starry shape of species such as *S. dilatatus* appears to be a trait that is lost in second generation hybrids, whilst the colour is maintained.

There are very few third generation hybrids around at present. Unfortunately there appears to be some genetic barriers to overcome before we can move further ahead. The problem may lie in the fact that we have created races of triploids that are proving sterile. Chromosome counts should be undertaken by someone with greater knowledge and understanding to help solve this potential problem.

Little work has been done using the Australian Moth Orchid, *Phalaenopsis amabilis* var. *rosenstromii.* The hybrid between *Phalaenopsis* and *Sarcochilus, Sarconopsis,* I feel has proved to be a bit of a fad. Viable seed has been difficult to produce in any but the tiniest of quantities and many of the hybrids are slow growing and reluctant to flower with any regularity. To top it all off they do not grow well without heat during winter in southern Australia and often the flowers look like poor "phallies" with small labella. Now that I've said that someone will probably show me a *Sarconopsis* that will blow me away!

I will now briefly discuss the main species being used to create these new hybrids and new colours. Three of the *Sarcochilus* species, namely *S. hirticalcar, S. spathulatus* and *S. weinthalii* have been included in the genus *Parasarcochilus* by Alick Dockrill — author of

Australian Indigenous Orchids. The main difference is that the above three species lack calli on the labellum.

Plectorrhiza tridentata

Commonly known as the Tangle-root Orchid, this has been behind at least three very dainty hybrids:-

Plectochilus Kilgra (X *Sarcochilus falcatus*) which comes in a range of colours from apple green — if the albino form of *Plectorrhiza tridentata* is used, through creams to rusty pinks.

Plectochilus Richard Jost (X *Sarcochilus hartmannii*), lots of flowers mainly creams with dark maroon centres. I have seen plants with six racemes to the growth.

Plectochilus Rumrill (X *Sarcochilus ceciliae*), miniature plants with brick red to deep purple flowers on progressive racemes.

This species varies quite a bit in the colour and quality of its flowers, some can be very floriferous and is a trait worth maintaining. The closely related *Plectorrhiza brevilabris* from Queensland should also produce some exciting results over the next decade. There are seedlings available of a speculative hybrid between *P. erecta* and *Sarcochilus ceciliae*. The first of these should flower later this season.

Rhinerrhiza divitiflora

The Raspy-root Orchid has been used in a handful of hybrids. Unfortunately many of these inherit the short-lived flowers of this stunning species. To my mind the primary hybrids *Rhinochilus* Dorothy (X *Sarcochilus hartmannii*) and *Rhinochilus* Rona (X *Sarcochilus fitzgeraldii*) are somewhat disappointing. The second generation hybrid *Rhinochilus* Vera (*Sarcochilus hartmannii* X *Rhinochilus* Dorothy) has a lot more to offer. It has large star-shaped white flowers with orange bands in the centre of the flower, which can last for over a week. The flowers generally all come out together unlike the primary hybrids which can be rather spasmodic with their flowering.

Sarcochilus australis

Two older hybrids, *S.* Southern Cross (X *S. hartmannii*) and *S.* Shooting Star (X *S. fitzgeraldii*) have been popular in collections. A recent remake of *S.* Shooting Star, using a dark form of *S. fitzgeraldii*, has produced some darker flowers than the original. *S.* Otways (X *S.* Lois) produced arching sprays of light to deep pink flowers. However the pick of these hybrids is *S.* Emily (X *S.* Mavis) which flowers over a long period with lovely maroon blotched flowers.

Sarcochilus dilatatus

A quaint brown species that has only been used in a handful of hybrids. Whilst *S.* Aussie Dawn (X *S. hartmannii*) is attractive, the recently registered *S.* First Light (Plate 1) (*S.* Aussie Dawn X *S. hartmannii*) is spectacular — already a couple from this grex have been awarded. These have ranged in colour from deep creams through to spotted/speckled deep pink to brown flowers with deep cream undertones. Hard to describe but well worth tracking down.

Sarcochilus hirticalcar
(***Parasarcochilus hirticalcar****)

A fairly rare north Queensland species, that is now more readily available due to recent efforts to propagate it from seed. It does best grown with some heat in winter, whilst its seedlings seem to be cold tolerant. *Parachilus* Riverdene (X *Sarcochilus hartmannii*) and *Parachilus* Frances (X *Sarcochilus ceciliae*) have been around for a while and has the advantage of flowering for up to six months of the year, at a time when there is little else in flower. This is a major trait that is passed on from *S. hirticalcar,* as well as longer lasting flowers.

Many of the recent hybrids have not yet been registered and some very deep brick reds have come out of the cross with *S. fitzgeraldii*. *Parachilus* Polka Dot (Plate 2) (X *Sarcochilus* Pinkhart) is a stunning hybrid in its better forms, many of these are a mottled deep pink and can produce long racemes on relatively small plants. Second generation hybrids, *Parachilus* Bobby Dazzler (*Sarcochilus* Pinkhart X *Parachilus* Riverdene) (Plate 3) and *P.* Frances X *P.* Riverdene (Plate 4) have

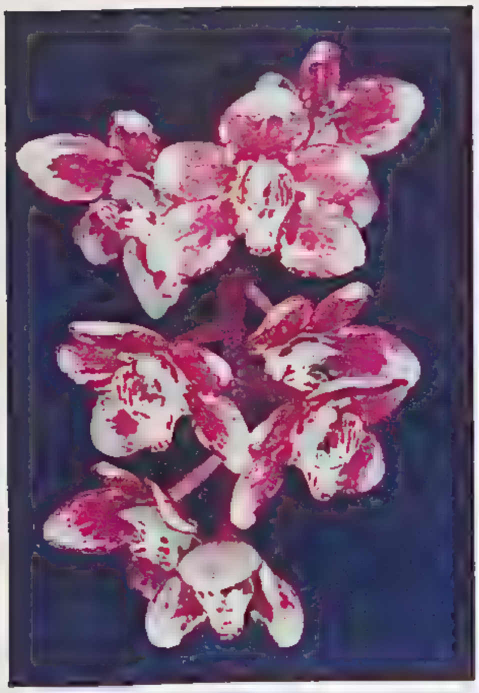


Plate 1: *Sarcochilus* First Light 'Butterscotch' AD/NSW.

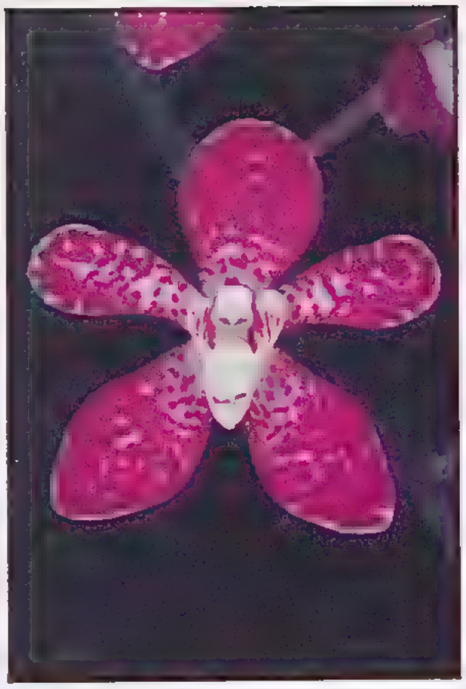


Plate 2: *Parachilus* Polka Dot 'Purple Haze' HCC/NSW.

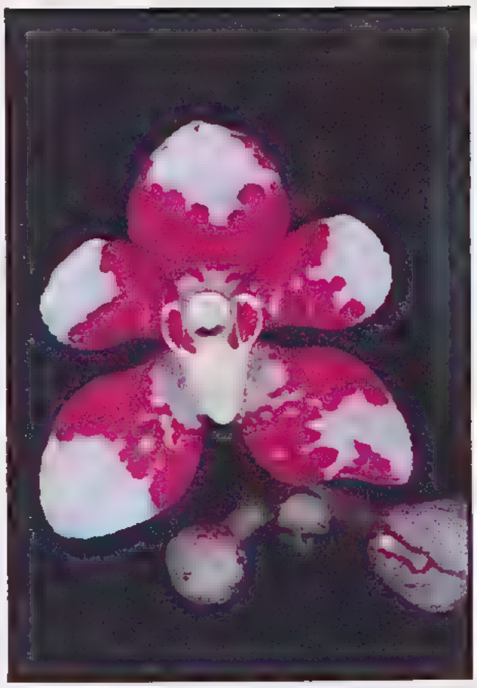


Plate 3: *Parachilus* Bobby Dazzler.

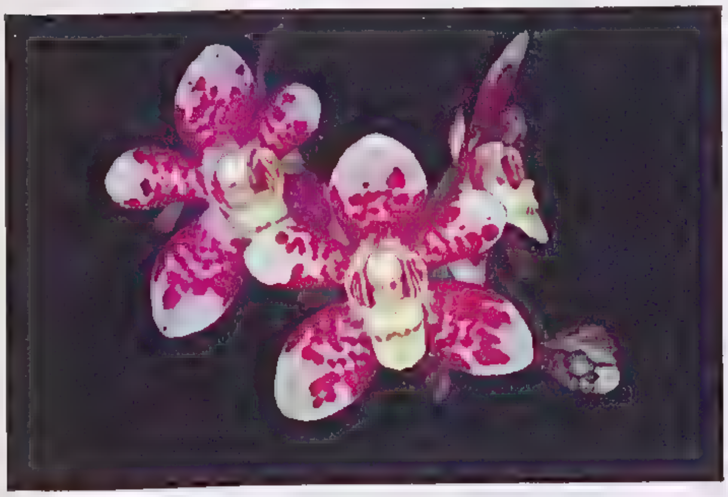


Plate 4: *Parachilus* Frances X *P.* Riverdene.

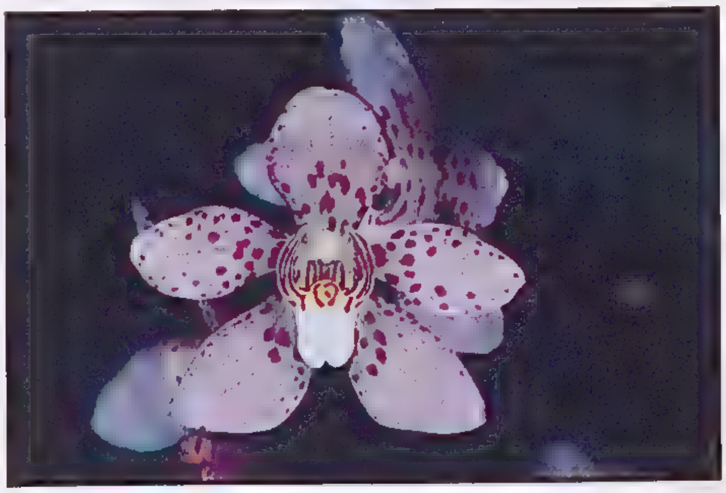


Plate 5: *Sarcochilus* Susan.

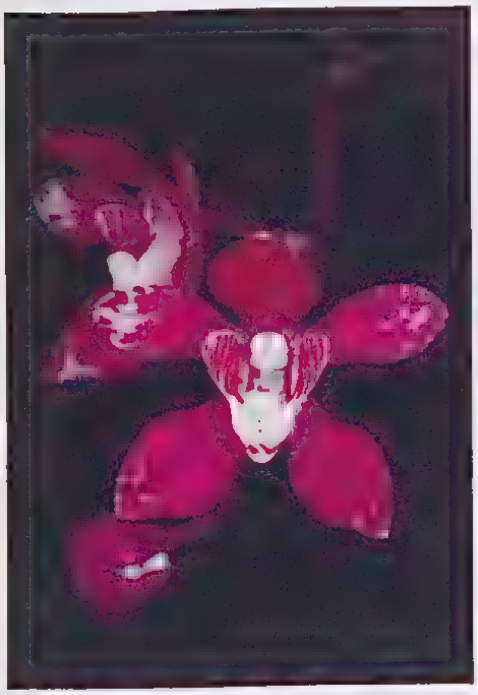


Plate 6: *Parachilus* Lotus.

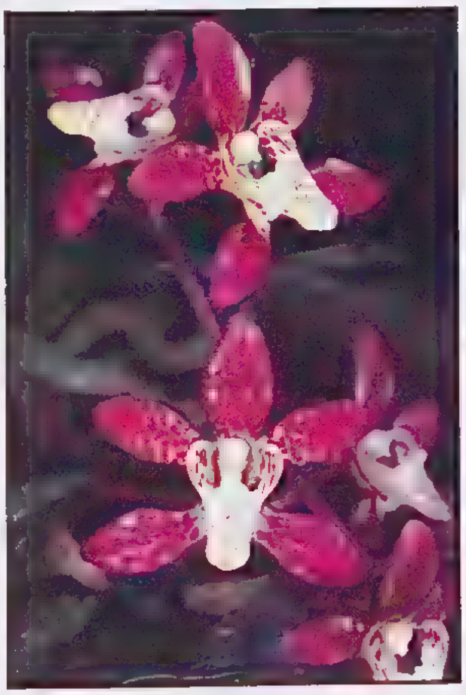


Plate 7: *Parachilus* Tigress.

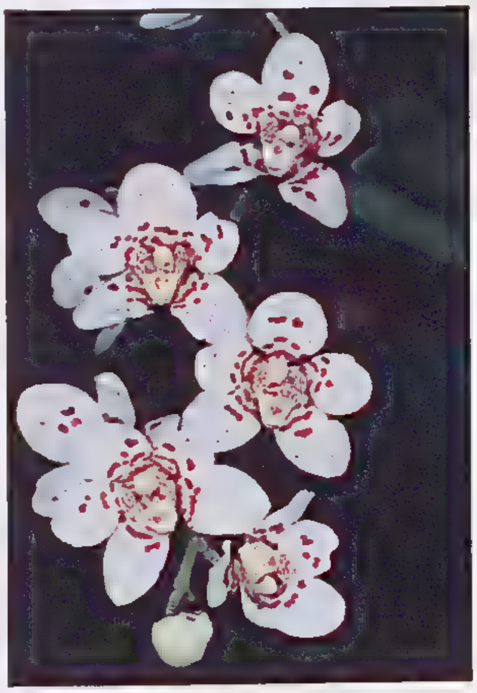


Plate 8: *Sarcochilus* Weinhart.

Photos by D. Banks.

definitely brought out the best characteristics from its parents.

Sarcochilus hirticalcar hybrids should always be snapped up when available as I believe this species is the key to having "sarcs" in flower year round.

Sarcochilus serrulatus

This north Queensland species was described in 1972, being previously confused with *S. olivaceus* var. *borealis*. I know of only two hybrids utilising this brick red to brown flowered species. These are *S.* Colonial Rose (X *S. hartmannii*) and an unregistered hybrid with *S. falcatus*.

Sarcochilus spathulatus
(Parasarcochilus spathulatus*)

Parachilus Lotus (Plate 6) (X *Sarcochilus* Lois) has been a consistent performer, producing deep purple flowers, with very few of poor quality. Some of the other hybrids of note are *Parachilus* Tigress (Plate 7) (X *Sarcochilus* Fitzhart) which comes in a range of sunset shades and the reliable *Parachilus* Perky (X *Sarcochilus hartmannii*). The unregistered hybrid with *S. falcatus* is well worth seeking out and obviously needs to be grown on a mount. We will see many fine hybrids from this species in the future.

Sarcochilus weinthalii

An uncommon species from northern New South Wales and southern Queensland which has unique bluish purple to chocolate spotted/blotched flowers. The hybrid *S.* Weinhart (Plate 8) (X *S. hartmannii*) is easy to grow and a reliable flowerer.

S. Susan (Plate 5) (X *S. falcatus*) produces unusual pinkish-grey flowers, however the pick of the hybrids is the dark pink spotted *S.* Jewell (*S.* Weinhart X *S. fitzgeraldii*). There are many unflowered *S. weinthalii* crosses in collections and flasks and we look forward to further progress in the seasons ahead. It is also very pleasing to note that selected outcrosses are being done between superior clones of this species to help entrench it in cultivation. In my experience, nursery raised plants have proved to be a lot easier to cultivate than their wild counterparts.

* [Ed: In this article *Parasarcochilus hirticalcar* and *P. spathulatus* appear under their new names *Sarcochilus hirticalcar* and *S. spathulatus*, but in *Sander's List of Orchid Hybrids* they still appear as *Parasarcochilus hirticalcar* and *P. spathulatus*, therefore hybrid registrations using these species, or their progeny, as parents with species or hybrids of the genus *Sarcochilus*, are registered under the hybrid generic name of *Parachilus*. (*Sarcochilus* X *Parasarcochilus*).].

PRESS RELEASE:–

FROM AUSTRALASIAN NATIVE ORCHID SOCIETY (WIDE BAY GROUP) INC.

Greig Bolderrow

The Australasian Native Orchid Society (Wide Bay Group) Inc. are once again running a weekend of lectures that will be of interest to all orchid growers. The weekend will be held, in Maryborough, on the 27th and 28th of May and registration charges have again been kept to a minimum. The cost of the weekend is $40 plus $10 for the Saturday evening spit roast.

The topics to be covered by our impressive list of guest speakers will include, "Using Pollinators to Aid in Taxonomy", Col Bower; "*Sarcochilus* Species and Hybrids", Wal Upton; "What the Judges Look For", John Hazelwood; "*Dendrobium kingianum*", Peter Adams; and "*D. discolor*", Ken MacPherson. Alick Dockrill will also be a guest and although we haven't finalised Alick's topic yet, rest assured that whatever he chooses to talk about will be of great interest. More speakers are yet to be confirmed.

The organising committee can organise motel accommodation for those wishing to attend.

As a special incentive to encourage early registrations the committee has arranged for a special early registration prize. The prize is two days accommodation at the world renowned ecotourism resort Kingfisher Bay, on world heritage listed Fraser Island. To be eligible for this fabulous prize registrations have to be with the Secretary before March 15.

Also on the agenda is a plant sales morning on the Sunday, allowing those who attend to recoup some of their costs. Nursery sales tables will also be operating.

All enquiries should be addressed to:–

The Secretary
A.N.O.S. Wide Bay Group Inc.
P.O. Box 15
Tinana, Queensland 4650.

AUSTRALIAN *LIPARIS* SPECIES (Part One)

Roy Gifford
2 Warrah Street,
Ettalong, N.S.W. 2257

A few years ago I wrote a short article for the N.S.W. Central Coast Group of A.N.O.S. describing the Australian *Liparis* species as I then understood them. Recent work by taxonomists and more study by myself has rendered this article obsolete so when I was asked to write a piece for *The Orchadian* it seemed a good time to update and expand my work on our native *Liparis*.

The genus *Liparis* contains between 200–300 species growing almost worldwide, most species having small blooms of muted colours, though some of the Asian species have very attractive foliage.

Australia is poorly represented, having only 11 species recognised at this time, one of them a drifter from the north and very rare. These 11 are all confined to the east coast of Australia, one or another appearing from the Victorian border up into Cape York Peninsula.

They may be found from sea level to above 1,000m, depending on the species and occur as epiphytes, lithophytes or terrestrials. The 11 species concerned are:- *Liparis reflexa, L. coelogynoides, L. swenssonii, L. angustilabris, L. bracteata, L. fleckeri, L. nugentiae, L. collinsii, L. condylobulbon, L. habenarina* and *L. simmondsii*.

Of these, the first seven are found as epiphytes or lithophytes and are relatively common in their chosen habitats. I know nothing about *L. collinsii* which is only a recent discovery — I know only that it was described by Bruce Gray in 1992, the publication being in *Austrobaileya* 3(4): 581–583, Nov. 1992 and that it is a terrestrial. *Austrobaileya* is not a publication available to most orchid growers and it will probably be years before someone describes the plant and flower in a readily available journal. The drifter from the north is *L. condylobulbon*, which, while common in South-East Asia and New Guinea, has been found on only a few occasions in Cape York Peninsula and the last two species on the list are terrestrial species.

When I first wrote about Australian *Liparis* species I — and most other students — thought that *L. swenssonii* was another extremely rare and doubtful taxon but recent studies have shown it to be the plant a lot of us grew as the "small flowered *L. reflexa*" and it is very common in some areas of its range.

Of the 11 species growing in Australia, I was lucky enough to see nine of them growing in nature, only failing to see *L. condylobulbon* and *L. collinsii*, and growing seven of them under cultivation with reasonable success. All *Liparis* species I know — I grew over 40 species at one time — have the habit of producing their inflorescence from the emerging new growth, the flowers fading long before the growth has matured.

In the following descriptions I have used the names listed in Mark Clements' work of 1989 and I would refer readers interested in the synonymy to that publication.

Liparis angustilabris (F. Muell.) Blaxell in Telopea 1: 357 (1978) (Figure page 301)

When I first wrote about *L. angustilabris* it was under the name *L. cuneilabris*, for this was the name used by all the people I knew at that time and it has only recently been given its correct label. Plants grow as epiphytes on rainforest trees or as lithophytes on mossy rocks at altitudes usually above 800m but occasionally turning up in much lower parts of the forest. It is a plant with fleshy green pseudobulbs up to 7cm tall by 25mm across, the new growth protected by several leaf-like

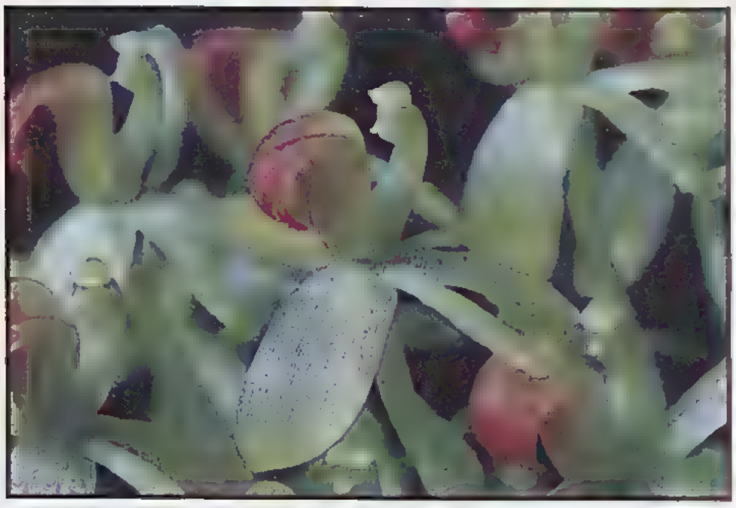


Plate 9: *Liparis condylobulbon.* Photo: D. Titmuss.

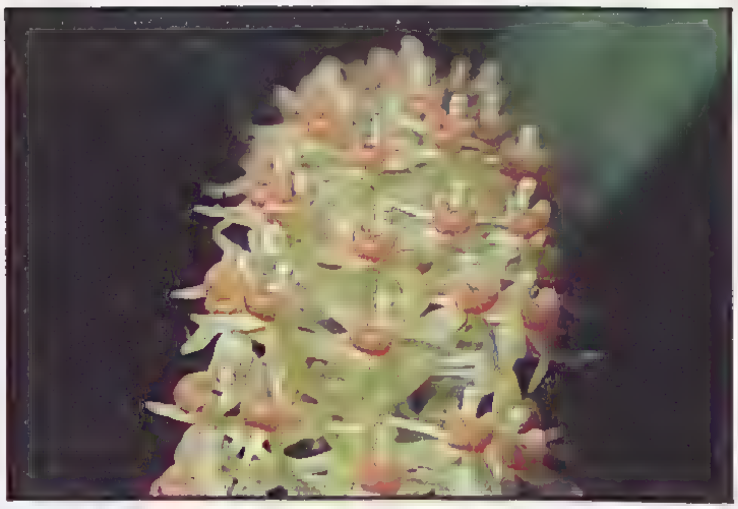


Plate 10: *Liparis condylobulbon.* Photo: D. Titmuss.

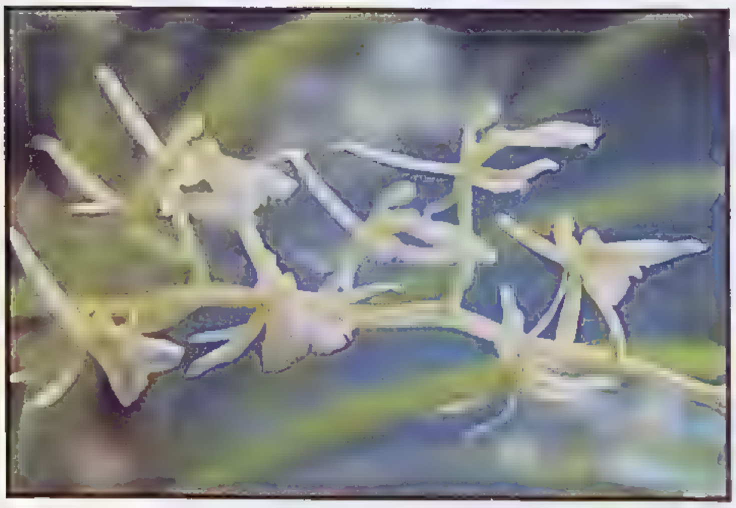


Plate 11: *Liparis coelogynoides.* Photo: W. Upton.

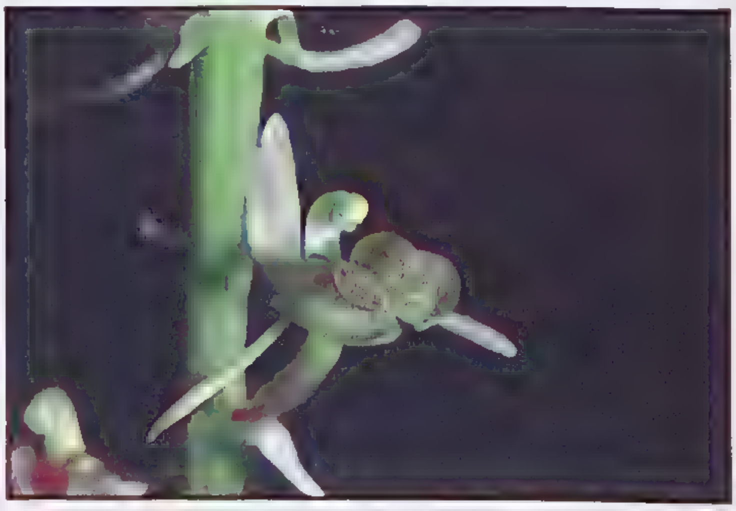


Plate 12: *Liparis habenarina.* Photo: W. Upton.

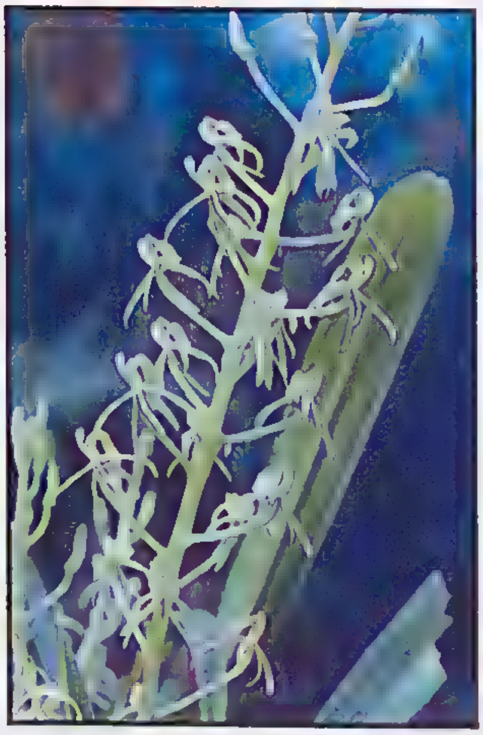


Plate 13: *Liparis bracteata.* Photo: M. Harrison.

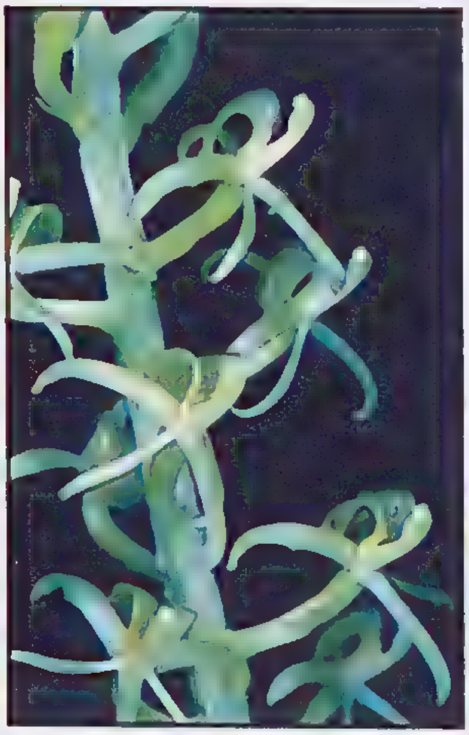


Plate 14: *Liparis bracteata.* Photo: M. Harrison.

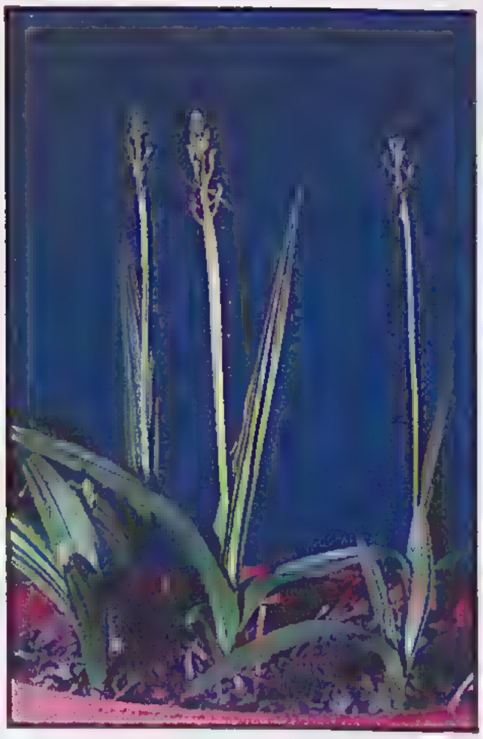
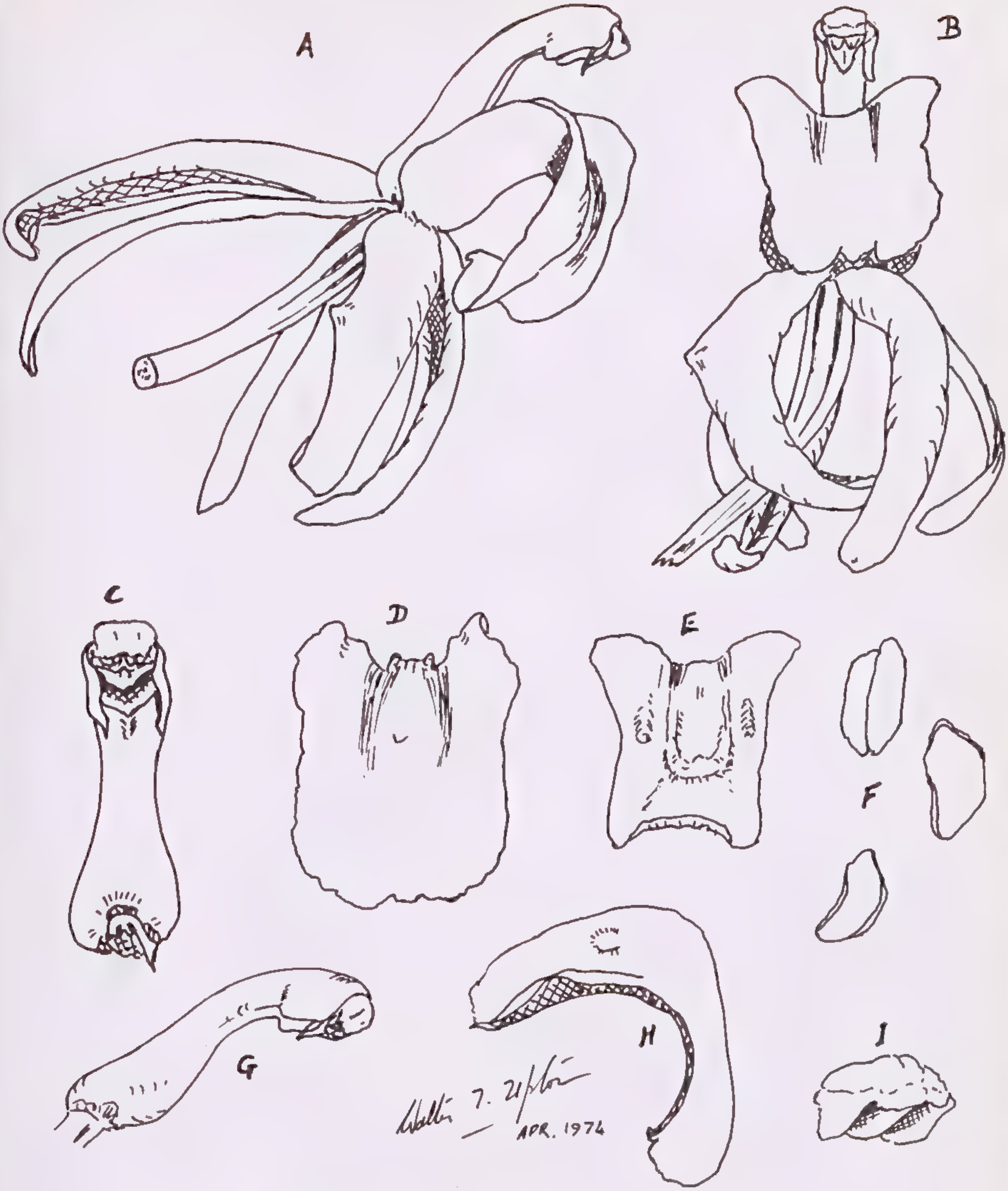


Plate 15: *Liparis habenarina.* Photo: W. Upton.



Walter T. Upton
APR. 1974

Liparis augustilabris (F. Muell.) Blaxell

A. Flower, side view	10X	F. Pollinia	approx. 20X
B. Flower, front view	10X	G. Column, side view	12X
C. Column, front view	12X	H. Labellum, cross section	12X
D. Labellum, front view	12X	I. Anther cap	20X
D. Labellum, rear view	12X		

sheaths which decay as the growth matures. There is one terminal pale green leaf some 25cm long by 20–25mm wide but the last protecting sheath is often extended and looks like a second leaf. This extended sheath is also more persistent than the other short ones and I would assume that it performs some of the functions of a second leaf.

Plants have virtually no rhizome, get multiple growths and soon form large clumps if healthy. This species used to be very common in the rainforests of north Queensland and I've seen it in large clumps on trees along creeks on almost every trip I had to forests between Townsville and Cairns — and I had a lot of trips in these areas in my salad days. Grows just as well on mossy rocks, but was more common as an epiphyte.

The inflorescence is a simple raceme some 20–25cm long, including an arching rachis of about 15cm. There may be up to 30 well spaced blooms held upright with the column almost in a straight line with the ovary and pointing at the sky. Blooms are 6–7mm across with the sepals and petals about the same length, very narrow and reflexed back around the ovary. Colour is a little variable, the sepals and petals being pale green to creamy yellow, very rarely white. The labellum is the most prominent part of the bloom, being some 6–7mm long by 2–3mm wide, oblong with the basal third following the line of the column, the labellum then sharply recurved for the remainder of its length, where it is bluntly pointed, rarely with a shallow notch. There are two narrow yellow ridges on the basal third leading to the base of the column. Plants bloom in the forest as new growths appear with the wet season and there are usually racemes around from late summer to mid winter, with blooms lasting 10–12 days. There is a faint unpleasant perfume which fortunately is not pervasive.

Under cultivation I could not grow this species in Townsville on the coast of north Queensland, the wet humid summer being too much for the plants but it grew well for me in the warm house at Ettalong, central coast of New South Wales, with a minimum winter temperature of 12°C.

I grew plants strapped to tree fern slabs with good results but found plants too large for most slabs so grew most of my plants in shallow terracotta pots with a well drained but water retentive compost and found they thrived in 60% shade, responded to regular feeding with weak nutrients and gave no trouble as long as I kept air moving. Planted in large — 20cm diameter — terracotta drip trays with lots of 10mm holes drilled in their bottoms the species took a couple of years to become specimens with 15–20 racemes and were then quietly attractive. In my controlled system they changed their growing habits, coming into new growth at almost any time but producing most flowers in late spring and summer.

Liparis bracteata T. E. Hunt, Nth. Qld. Naturalist 14(81): 9.f. (1946) (Plates 13 & 14)

Many years ago those of us in north Queensland who were interested in miniature native orchids regarded this species as a late flowering form of *L. fleckeri* for we could see little difference between the two — I might add that taxonomy was a minor concern in those days — and it seemed to differ only in its flowering season.

A few years later, in the early fifties, I formed a close friendship with Trevor Hunt and my realisation of how much Trevor loved a new species only served to strengthen my suspicion that the differences between the two entities were not enough to warrant a new name.

With time however I have come to think that I was a bit hard on my old mate and so I offer him a tardy apology and accept his name. I owe Trevor a great debt of gratitude for he was my friend and mentor in my learning time and the little I know about Queensland native terrestrial orchids was basically learned at

Trevor's side. He was by far the best I've ever known at finding native terrestrials, for he spent every holiday over many years learning the habitat of our natives and one had only to mention a name for Trevor Hunt to immediately give a detailed description of where and how the plant grew, when it bloomed and any other detail one might ask about. I found my first plants of *L. simmondsii* in Trevor's company for he knew where it should be growing — we went there and sure enough it was.

Anyway, *L. bracteata* grows naturally as an endemic epiphyte on rainforest trees along the eastern ranges from Tully to Cairns and occasionally as a lithophyte on mossy rocks where conditions suit, where it can really form large masses. It is rarely found below 800m and plants I tried to grow in Townsville at sea level did not survive the first summer.

Plants are clumping with pseudobulbs soft and fleshy when young, 3–5cm high by 15–25mm across, protected as they emerge by 3–4 leaf-like bracts which decay as growths mature. There are two terminal leaves 10–20cm long by 10–20mm wide, deeply grooved with the midrib forming a prominent keel on the under side. The whole plant is dark green in suitable light, the pseudobulbs smooth and shiny when young but becoming rough and wrinkled with age — the main reason we regarded plants as late blooming *L. fleckeri* in the early days.

The inflorescence appears from the new growth and reaches 15–20cm long, of which at least two-thirds is peduncle. The peduncle has up to a dozen prominent bracts which stand free and do not sheath the stem, getting smaller as they reach the rachis. The rachis has up to 10 blooms which stand out well, with the curved column in a straight line with the ovary and pedicel. The sepals and petals are about the same length with the sepals twice the width, all some 8–10mm long by 1 or 2mm the dorsal sepal and the petals almost at right angles to the column, the tips curving slightly. The lateral sepals recurve into a semi-circle, the tips usually ending around the base of the ovary, one each side. There seems little variation in colour, most flowers being pale green when fresh, becoming yellow with age. The labellum is 7–8mm long by 3–4mm wide if flattened, deeply channelled, the base upright and clasping the column, then curving over and down with the apex tending to curl under. There are two raised joined calli just above the base, a lovely green and from them two parallel orange stripes which extend to the curve. Plants flower in the forest with the emergence of new growths in late winter and flowering continues as growths develop, ending around mid spring. Individual blooms last 10 days or so and their perfume is not as objectionable as some.

This species was very common in the higher rainforests of the north some 45–50 years ago and I found it on almost every stream I climbed in those days, often in very large masses — especially when growing as a lithophyte. It was everywhere on Mt Bartle Frere above 800m and was one of the commonest orchids there.

Under cultivation I could not keep plants alive on the coast in north Queensland but found it not hard in a warm house on the central coast of New South Wales. I put plants in shallow terracotta pots in a well drained but water retentive compost, give them 50–60% shade, kept fans moving air always, fed regularly with weak nutrients and held winter temperatures at 12°C minimum. In this house I found plants tended to change their growth habits and make new growths at other times than late winter early spring, so that the flowering season was greatly extended. Not a plant for tropical lowland bush houses but relatively easy in a warm house in temperate climes and an interesting little native worth a place in the collection of miniature species.

Liparis coelogynoides (F. Muell.) Benth., Flor. Aust. 6:273, (1873) (Plate 11)

This little guy seems to be the maverick of the genus as I know it, for I have not seen any other species which is quite like it. It is endemic to the east coast ranges of New South Wales and Queensland, from the Hunter River in N.S.W. to the Bunyah Mountains in Queensland with one record from far north Queensland.

Plants are found in the rainforests at medium altitudes, usually growing as epiphytes but occasionally lithophytic, always forming small clumps of maybe 8–9 growths — never much more. Pseudobulbs are small and squat, 10–12mm high by 14–16mm across, protected by 3–4 papery bracts and two more substantial ones as the growth matures. The thin bracts soon disintegrate but the other two — more leaf-like — remain for some time and I assume perform some of the functions of a leaf. There are two terminal leaves, quite thin and tough, 12–15cm long by 15mm wide, the tips rather sharply pointed. In good (50%) light the whole plant takes on a lot of pigmentation and becomes very brownish/green. My experience is that plants are reluctant to flower unless light is good. Mature pseudobulbs become deeply grooved and wrinkled and are relatively short lived for an epiphyte.

The inflorescence appears with the new growth and is a simple arching raceme to 20cm long, about half of which is rachis bearing up to 20 blooms which open widely and are usually well spaced. The sepals and petals are around the same length — 8–10mm — the sepals 2mm across, petals 1mm wide. The labellum is unusual in shape among the *Liparis* species I knew, being wedge shaped with the apex broad and squared off, there being a shallow cleft in the centre with a short fine point therein. The length is 10–12mm, the basal third narrow and almost parallel to the column, thence gradually flaring to the blunt tip. There seems little variation in floral colour, all flowers I've seen being green/yellow with some difference in the dominance of each colour giving a change in flower shade.

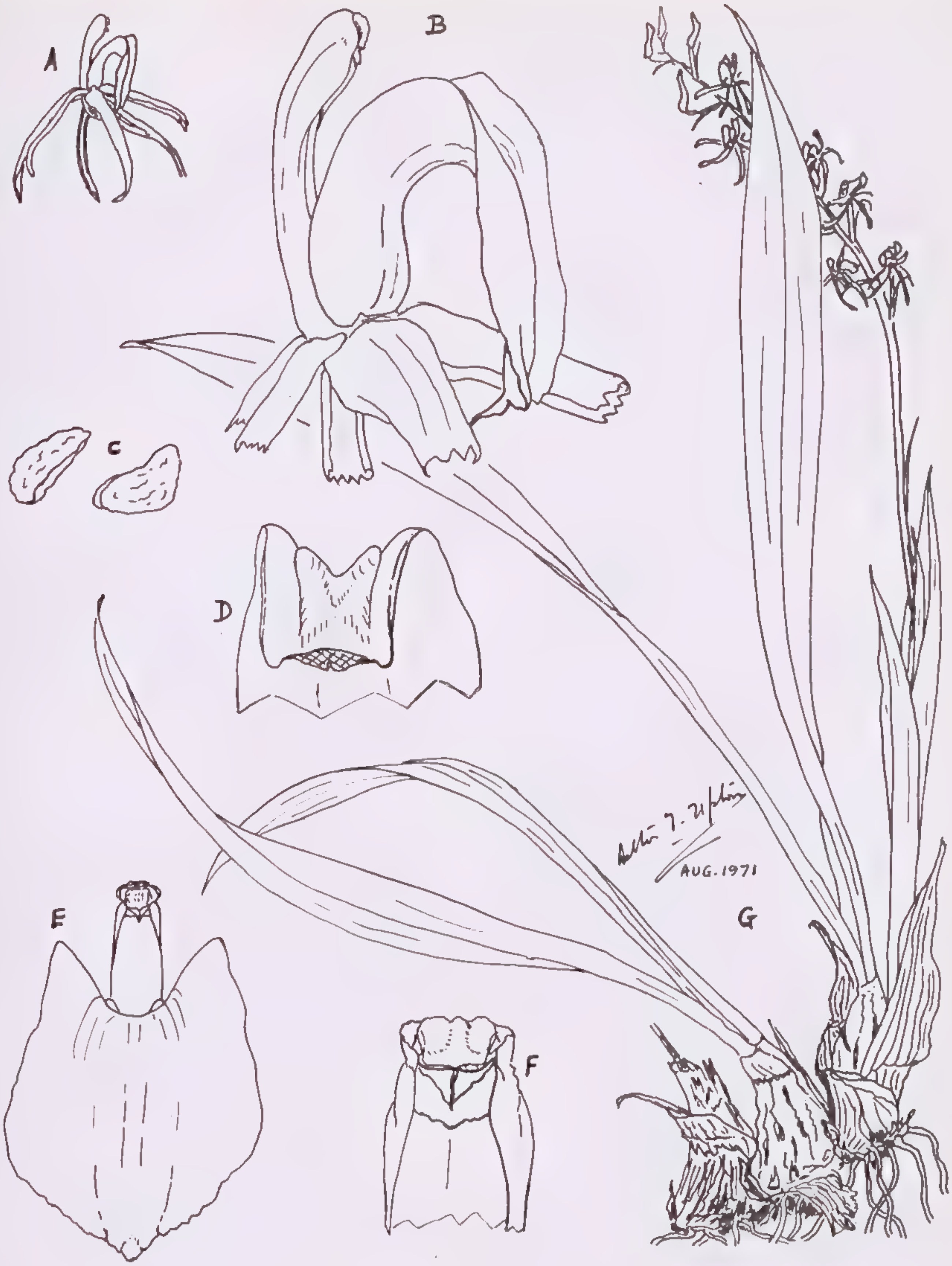
Under cultivation I found this species very difficult in my bush house on the N.S.W. central coast, plants languishing at best and not liking our hot dry summer winds at all, so I moved them into the warm house where I had pretty good control of the environment and they gave me little trouble thereafter. I grew my plants mounted on slabs of tree fern kept always damp, fed every second watering with weak nutrients, had fans circulating the air always, gave no more than 50% shade and kept winter temperatures at a minimum of 12°C. These temperatures were a bit high for the plants liking, I found, so I hung plants in the coolest places I could find in winter and I had a system of micro-misters rigged up whereby I could keep summer temperatures down and control himidity when the hot dry winds blew. With these conditions *L. coelogynoides* was no great problem and it is a neat little plant which takes up no room and produces flowers better shaped than most, with no discernable stink. In the forest, plants flower mostly from late spring to mid summer and since plants make few growths at any time, I never had them flower much outside this period.

Liparis condylobulbon H. G. Reichb., Hamb. Gartenz. 18:34 (1862) (Plates 9 & 10)

I know nothing of this species outside the references, having never seen a plant — not even an exotic — so I can only refer any grower lucky enough to get a plant to David Jones for ideas on its successful cultivation. Sorry.

Liparis fleckeri Nicholls, Nth. Qld. Nat. 6(53):1.f. (1938) (Figure page 305)

This chap is endemic to the ranges of north Queensland around the south-eastern corner of Cape York Peninsula and a little south, where it grows as an epiphyte on mossy trees but more



Liparis fleckeri Nicholls

A. Flower 2X
B. Column & labellum, side view 8X
C. Pollinia approx. 25X
D. Labellum, rear view 8X
E. Column & labellum, front view 8X
F. Top of column, front view approx. 20X
G. Plant 2/3X

commonly as a lithophyte on mossy rocks above 800m — rarely below. It used to be very common in the high country behind Cairns and was extremely abundant on the Bellenden Ker, where a mate and I once found huge clumps on rocks high on Mt Bartle Frere, blooming in mid winter. We had been conned into climbing the mountain with tales of a red flowered *Phaius* a guy claimed grew there so up we went in the middle of the dry season to find it. We found **no** red *Phaius* but we did find that there is no dry season on that mountain — we stayed for awhile, some few days and were never dry, with wet fogs rolling in at any time and always at night. Saw a lot of orchids though and *Liparis fleckeri* was one of the commonest.

Pseudobulbs are roughly pear shaped, 2–4cm tall by 2–3cm across, relatively smooth when young but soon become deeply grooved longitudinally with the ridges wavy, the surface between grooves rough and pebbled. New growths are protected by 3–4 short bracts which soon decay, the pseudobulbs with two terminal leaves folded at the base and 20–35cm long by 2–3cm wide, rather thin in texture with sharply pointed tips. The whole plant is pale green when healthy but will show some reddish pigmentation if exposed to strong light — less than 50% shade.

The inflorescence, a simple raceme is produced with the new growth and may reach 20-25cm in length, slightly arching, the rachis around half the total length and carrying up to 20 flowers. There are a few small semi sheathing bracts on the peduncle which are drawn out to fine tips, but these are not like the sheaths on the peduncle of *L. bracteata*. Flowers are well spaced and open widely with the sepals and petals all reflexing in sweeping curves so that they almost meet at the base of the ovary. All these segments are wider at the base than the apex and taper so that their tips are fine curled points, the dorsal sepal being 6–7mm long by 2mm at the base, the laterals a little longer and wider at the base but not by much. Petals are roughly the same length as the lateral sepals but only about half as wide. The labellum is 6–7mm long by 3–4mm wide when flattened, the basal third grooved and clasping the column, the lip then bending down sharply and expanding to an almost rectangular blade which is almost parallel to the ovary. Occasionally the lip is somewhat rounded at the apex, the high shoulders giving an elongate heart shape when viewed from the front. Flowers are usually clear pale green, very rarely tan or white with the labellum always having two joined calli on the erect part which are bright orange, but there are no yellow lines. In the forest, plants bloom with new growth which starts in late autumn and is usually over in a month or so — plants do not seem to mind that it is **very** cold and wet at that time and tend to rest **later** when the weather warms.

Under cultivation I found this species impossible on the coast in north Queensland and not easy in a warm house on the N.S.W. central coast, though I did grow it with some degree of success for several years. Plants were potted in shallow terracotta trays with extra drainage holes in an extremely well drained compost which I kept always damp. It is not easy to get the balance right between too dry and too soggy compost and plant roots react adversely to either state, so constant attention must be given to watering and drainage. Air must be circulating gently at all times but this is almost given for any warm controlled house and is easy to arrange, with a few cheap fans sited strategically around the house and never turned off until they blow up — then replaced immediately. I fed with weak nutrients every second watering while ever plants were showing active growth and gave 60% shade with the winter temperature held at 12°C. Treated thus, plants grew well enough but did not get the abundance of growths thrown by plants in the forest and so did not get near as many flowers. I only had plants in cultivation for about five years so maybe they would adapt better over a longer period — it is certainly worth persevering with, for in nature the species has a restricted habitat and could be endangered by any change in its environment.

Liparis habenarina (F. Muell.) Benth. Fl. Aust. 6:273 (1873) (Plates 12 & 15)

This is one of the three terrestrial *Liparis* species endemic to the east coast of Australia and is found in rather open areas of grassland or in sparse *Eucalypt* forest from north-east N.S.W. to the Barron River in north Queensland (Dockrill). Plants are deciduous, growing and flowering in the warmer wetter months then the foliage dying off for the cooler seasons. The pseudobulbs are buried some 7–8cm below the ground surface and the plants I have seen in situ were all small clumps. Pseudobulbs are pretty tough and fibrous, about 3cm high when mature and 15–25mm in cross section, almost oval in shape with a very blunt apex. There are 3–4 short lived sheaths which protect the emerging growth and three coarse terminal leaves up to 25cm long by 4cm across, their bases elongated and clasping the inflorescence which develops with them. The leaf blades are prominently veined, sometimes folded to some degree and elongate ovate with pointed or rounded tips, usually a paleish green in colour.

The inflorescence is a simple raceme which is erect, quite angular in cross section and up to 50cm tall, the rachis usually only about the top fifth of the whole and bearing relatively few flowers, 6–20, according to the size and maturity of the plant. Flowers are well spaced and held clear of the rachis, the pedicel and ovary curving up. The dorsal sepal and the petals curve sharply back and down, the laterals not so sharply, these tending upward and then down in a gentle curve below the labellum. The dorsal is 7–8mm long by about 1mm wide, the petals also very narrow, a little shorter than the dorsal but even narrower — perhaps 0.5mm wide. The laterals are wedge shaped, joined along their inner edges for some distance but usually with their tips free, around 3mm wide at the bases. The labellum is 5–6mm long by 3–4mm wide with a deep cleft at the apex, each side rounded. There are two prominent keels which begin at the base and meet where the apex cleft begins, the whole organ reflexing in a sharpish bend about half way along. There seems to be little variation in floral colour, all flowers I have seen being green/yellow with one shade or other being more dominant from clone to clone. Plants flower from mid summer to early autumn and from my observations blooms would last 10–12 days. Their perfume is unpleasant but not as bad as some.

I have never grown this species in cultivation, but I found it many times along the slopes of the Blackall Ranges when I spent a few years roaming there in the early fifties, firstly by accident on the upper reaches of the Mooloolah River when I was poking around just looking and found plants in bloom. Thereafter I knew where and when to look — and it was not uncommon in those days. I did carefully excavate down one side of a few plants to see what the underground parts looked like but otherwise I have no experience of the plants needs. I would imagine though that it would respond well enough if potted in a deepish pot in a well drained compost and put in a brightly lit spot where it could do its thing in peace. The only extra care would be the need to watch pots while plants are dormant. They would probably respond well to feeding with weak nutrients — preferably organic — once growth shows above ground. I do not think plants would appreciate compost becoming bone dry during dormancy for there are usually winter rains to supply some ground moisture — at least where I knew the species.

AUSTRALIAN NATIVE ORCHID HYBRID REGISTRATIONS

(New registrations from lists in *The Orchid Review*, November, 1994/February, 1995):–

Name	Parentage	Registered by
Dendrobium		
August	Colin X Joy Wray	Florafest (I. Klein)
Darlington Gold	Essie Banks X Aussie Ira	H. A. Wilson
Darlington King	*kingianum* X Aussie Ira	H. A. Wilson
Dustie's Joy	Colonial Surprise X Lorikeet	Florafest (I. Klein)
Elegant Sunrise	Elegant Heart X Morning Light	W. T. Upton
Fred Steenbeeke	*striolatum* X *monophyllum*	G. Steenbeeke
Gillieston Aura	Gillian Leaney X Aussie Ira	W. Skillicorn
Gillieston Gem	Gulginni X Aussie Quest	W. Skillicorn
Gillieston Gleam	Star of Riverdene X Susan	W. Skillicorn
Glorious Nugget	Golden Glory X Nugget	Florafest (I. Klein)
Glory Fleck	Golden Glory X *fleckeri*	W. Skillicorn
Glowing Lime	Sun Sprite X *kingianum*	Florafest
Golden Grace	Golden Fleck X *gracilicaule*	Florafest
Green Gascades	Dainty Cascades X *pugioniforme*	W. T. Upton
Hamilton	Kathryn Banks X Rutherford Surprise	K. D. Hamilton (J. Purvis)
Hazel	Gillian Leaney X Wonga	B. Bedggood (D. Mitten)
Isobel Donovan	Star Imp X *falcorostrum*	J. Donovan
Jayden	Elegant Heart X *speciosum*	W. T. Upton
Jesmond Sparkler	Star of Gold X Zip	J. Purvis
Katandra	Arakoola X Ku-Ring-Gai	R. & D. Sheen
Kay Mitchell	Dot Sheen X Hilda Poxon	N. Mitchell
Narellen	Narraweena X Ellen	W. T. Upton
Primrose Grove	Dot Sheen X Zip	R. & D. Sheen (D. Mitten)
Ray's Dream	Aussie Child X Ellen	Avril Hill (Ray Hill)
Rosely Taifalos	*tetragonum* X *canaliculatum*	P. Sourrys
Sparkler	Berry X Ellen	Orchid Zone (M. Pendleton)
Strioling	*striolatum* X *linguiforme*	W. T. Upton
Tania's Pride	Zip X Bardo Rose	J. Purvis
Yondi Belle	Ellen X Yondi Brolga	S. Batchelor

WANDERING, OBSERVING AND RECORDING

Ralph Crane
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This paper details a follow-up trip to that described in *The Orchadian,* Vol. 11, No. 1 (September, 1993).

In early winter 1992, I had the opportunity to inspect an area on the south-western edge of the Darling Downs, in south-eastern Queensland. A lady had given me an orchid flower from this area for identification and it turned out to be an undescribed taxon. Further investigation was warranted.

Upon arrival, she was able to show me several locations and further searching revealed many similar rosettes over a wide area on state forest and private property. The original flower was one of the "rufa" group of *Pterostylis* and it was flowering in spring. It quickly became obvious that a comprehensive survey would be essential.

In a rocky gorge, many rosettes of a kind similar to *P. parviflora* were seen growing over a wide area in rocky crevices, often with maiden hair fern. I deduced it was an autumn flowering species due to the presence of numerous recently chewed-off inflorescences.

On a different day, whilst searching further afield, a single flowering plant of the undescribed *Pterostylis* was found, growing under bushes locally known as "turkey bush", a shrub which grows to about three metres tall. As I pushed into this large clump of bushes looking for further flowers, my concentration was broken by a loud grunting noise. I looked up and saw a wild pig, not more than five metres in front of me. As these bushes are not strong enough to support the weight of a person and yet too thick to stand upright in, we just looked each other in the eye. This situation seemed to go on for an eternity, but in fact it was only seconds before the pig turned and moved away. Returning the next day I was able to find several more flowers in this area. They resemble *P. longicurva* and are at present under further investigation.

With this information and the knowledge I had gathered on that earlier trip, I planned a return visit in the spring of 1992. I left home in mid-September and was away for a month, covering approximatly 4,000km. It was a trip I will always remember.

Returning to the original area, I located *Caladenia fuscata* and *Pterostylis bicolor* occurring among Cyprus pines in a number of locations on the outwards journey. Upon arrival at the property it started to rain, as it had done on my earlier visit, but by next morning the weather was clear. A short walk of some 50m from the house revealed many *Pterostylis* flowers of the "rufa" group. This species was identified as *P.* aff. *boormanii* and it has been seen and recorded in a number of locations in this district.

I returned to the state forest where I had encountered the wild pig (feral goats are also common here, especially in rocky country) and found a number of *Pterostylis* species. That day, in an area of perhaps two square kilometres, I saw *P. mutica, P.* aff. *boormanii,* a form of *P. hamata, P.* aff. *mitchellii,* a species first collected north and south-east of Roma in the spring of 1991, a different form of *P. hamata* and a collection which contained *P. mutica* and *P. cycnocephala* growing together. A pale green flowered form of *P.* aff. *boormanii* was also seen, which differed from the normal red-brown colour. *Caladenia fuscata* was also present. These species were not unduly affected where cattle were grazing, but crossing a fence into a paddock which contained sheep, I notice they just disappeared, although the vegetation type did not differ.

I was joined next day by a botanist from the Queensland Herbarium who wanted to look at some interesting *Macrozamia* plants I had seen.

He wanted to show me some country a further 150km to the west, which he thought would interest me. Leaving the property before sunrise, we made a hazardous journey, due more to goats than kangaroos. It was an unusual area, consisting of five or six hectares which rose about 15m above the surrounding sandy cyprus plains. A four-wheel drive vehicle was necessary due to sand bogs and the very steep track leading up to the flat table-top. Approximately half the area was covered by dwarf heath no more than 25cm tall. Around the outer edges amongst the rocky outcrops occurred cyprus pine and stunted eucalypts. The dwarf heath grew in very shallow sandy soil on a solid sandstone base.

Investigation of the timbered margin around the edge revealed terrestrial orchids. I saw old seed pods of *Caladenia caerulea* and *Pterostylis parviflora.* This latter species is quite red in colour compared to the green form from the Glasshouse Mountains district. A *Calochilus* which may have been *C. robertsonii* did not travel well, so positive identification will have to wait until further flowers can be obtained. Nearby I located a number of flower buds of a species with a fine single leaf which I did not recognise. As we were looking at one of them, the flower opened to reveal its identity, a *Caleana,* or flying duck orchid. This species appears to be an unidentified taxon, with a flower similar in size to *C. minor,* but light green and white in colour.

In the first week of January, 1993, I had the opportunity to return to this location with the botanist, fully aware that at this time of the year it would be hot and dry. In the heath patch I located an old, dry flower of *Orthoceras strictum,* something I would not have expected to see in a region which receives only about 750mm (30 inches) of rain annually.

Proceeding from here on the original trip, we visited a number of heath type locations, which varied only from the original because they were not raised above the surrounding countryside. In one of these *Pterostylis bicolor* was widespread, *Caladenia fuscata* was seen occasionally and *Diuris tricolor* was scattered in occurrence. Throughout this district *Cymbidium canaliculatum* was seen growing in tree hollows, in the forks of cyprus pines with the roots penetrating the bark, or in old cyprus logs on the ground, with the orchid roots piercing the old cracked bark and entering the rotting timber.

From here I moved on to the Chinchilla area where I had found some *Pterostylis* the previous year, then known as *P.* aff. *rufa,* but now referred to as *P.* aff. *lingua.* A search of the area showed that this species is not common, although a few were seen some 500m further along the track. About 3km away I found a number of other *Pterostylis* growing in a small area, which turned out to be *P.* aff. *mitchellii* (the previously mentioned species from near Roma) and *P.* aff. *boormanii.* In a hard, flat clay-pan, two plants of *Diuris tricolor* were seen, along with a single rosette of a *Pterostylis.* I believe this area may produce other interesting finds during a year of normal rainfall.

Another day I came across an old sleeper mill site, with a sawdust pile some 8m high by 30m across. As I walked around it, it became obvious that this pile had been started near an eroded creek bank and that the sawdust had overflowed into the creek, making the pile over 11m high on that side. It was surrounded by a hectare or more of neatly stacked ironbark flitches, up to 1.8m deep and upon these flitches grew in excess of 1,000 plants of *Cymbidium canaliculatum,* from seedlings to mature plants up to 450cm across, heavily in spike. These were the most healthy plants I have ever seen and the easiest for collection. Their large roots travelled amongst the flitches and under the bark still attached. I was able to remove one plant with its 2.4m long root system undamaged. I suppose one day a bushfire will catch up with this colony and one can only guess for how long it will burn with this fuel supply. It may turn out to be a good source of charcoal. I had hoped to return to this site on my way home a week or so later, to see what I believe would have been a marvellous display and a chance to compare *Cymbidium* flowers, but this was not to be. Moving on to the Roma district, where I based myself at a friend's home, I re-visited a state forest to the north of the town where I first saw *Pterostylis* aff. *mitchellii* the previous year. Here I located many more flowering plants than the few I had seen before. Later, to the south-east, I again saw this species in greater numbers and over a much wider area. Also seen over a wide area was *P.* aff. *lingua.*

I made contact with a local woman who is interested in wild flowers. She told me she knew the whereabouts of some greenhoods, bearded and flying duck orchids and she was prepared to show me these locations. We arranged to meet her at The Gums at 12.30 p.m. and I could only guess at what was in store, as the country we were to visit averages only 500mm (20 inches) of rain a year.

We met at the arranged time and she suggested we follow her to the *Pterostylis* habitat. After an hour's drive down the highway and a short journey along a dirt track, through country where, if lucky, you saw a couple of trees every kilometre, she pulled up. My friend looked at me and I at him, thinking what a joke it was to travel this far and then stop at a group of five or six trees just inside the fence. We were informed that it had been 10 years since she had seen these orchids, but we had the permission of the property owner to go in. My friend said he would have a quick look so as not to disappoint her and upon reaching the trees he beckoned me over. We saw a single flowering plant of *P.* aff. *mitchellii* under a small prickly shrub and we could not believe our eyes. The surprise on our faces must have been noticed, as she commented that we looked doubtful about this spot when we pulled up.

A further couple of kilometres up the road we came upon a few acres of natural scrub. We spent a while looking around and came to the conclusion that this species must have been well distributed before clearing took place.

Time would not permit her to show us any other areas that day. She suggested that rather than spend the night in the bush, we should put our sleeping bags on the verandah at her place. On the way back we stopped at a spot she had not looked at before, but which she thought might be of interest. Here we saw many dried seed pods of *Caladenia caerulea* and also many flowering plants of *Pterostylis* aff. *mitchellii.* Both species were growing in very hard ground which, during wet weather, would be a wet and boggy watercourse.

On arrival at the house, we found it to be a 50-year-old mud-brick house with external walls 350mm thick, in which the Spotted Pardalotes had been trying to build their nests. In most cases they had not stopped tunnelling in time and had ended up breaking through to the inside; the walls showed signs where the holes had been plugged.

After a meal and a long talk, we settled down for a little sleep, not realising that lights out only meant the beginning of fun and games. A sizable family of possums delighted in racing over and sliding down the tin roof.

The following morning we left about 9.00 a.m. and travelled to a place our host called "spinifex corner" to look for flying duck orchids. An unlikely spot, the vegetation consisted of an unusual stunted ironbark gum about 3m tall, with scattered *Leptospermum* type shrubs growing in pure sand. In the open areas large clumps of spinifex grass grew, spreading to nearly a metre across. Here in the middle of these clumps was a species of *Caleana* (flying duck orchid), with its tubers growing amongst the roots of the spinifex. A quick look soon showed this species differed from those with which I am familiar and I believe it is new to science. It appears to be quite unusual, in that when the seed is ripe, the capsule does not split open, but the seeds germinate within the capsule, to be released later as small plantlets. One would guess this is nature's way of giving the young a flying start to life in this arid environment. It is possible this species has affinities with *C. minor.*

We moved on to another area, just as desolate and here our luck ran out. Our host said she thought she had seen some caladenias here years ago, but the more she talked the more they sounded like glossodias.

Unfortunately, we saw neither. By now the sun had moved well past the halfway mark and the location for the *Calochilus* orchids was in the opposite direction. We had to bid our host farewell and head back to base, where we arrived well after the stars had started to show their lights. The *Calochilus* have been left for another day (or year). Being beggars for punishment, we just had to stop at a number of locations on the way home, spots which before this trip I would not have bothered with, and yes, we saw more *Pterostylis* in flower.

What a couple of days these had been, an experience I will long remember. Once again I was left wondering just where else these little treasures will be located and how many we have missed or lost through the clearing of the countryside for cultivation and grazing. Low rainfall areas, around 500mm (20 inches) a year, appear to be suitable to a number of species and I expect they will be recorded even further west than these present sightings, given time.

Upon returning home some four weeks and 4,000km later, we had seen only some of the areas where terrestrial orchids occur. I believe there are still many orchids to be discovered in areas such as those I have described.

AROUND THE GROUPS

A.N.O.S. NORTHERN REGIONAL COUNCIL

The third meeting of the Council, hosted by A.N.O.S. Wide Bay Group, was held at Maryborough on the 29th October, 1994. Delegates from the seven affiliated groups in attendance. The meeting was preceded by a barbecue and plant auction. The auctioneer, George Rex, managed to extract $55.00 for a specimen plant of *Dendrobium speciosum,* reported to have been collected from Linderman Island 80 years ago. All plants were donated and $233.50 was raised and given to Council. Business transacted during the three hour meeting was:– Opening of a bank account; Acceptance of Interim Budget, effective as soon as Council is incorporated; grateful acceptance of a $200 donation from the Orchid Council of Queensland. Agreed to keep A.N.O.S. Far North Coast Group, A.N.O.S. Townsville Group and Len Lawler, who has a small band of A.N.O.S. supporters at Cairns and the Tableland, informed on Council's activities.

Submission of a draft paper on Council's Conservation Policy — to be ratified at the next meeting.

General agreement with the latest draft paper by the Department of Environment and Heritage in reference to the alterations to the Regulations on Flora and Fauna in Queensland.

Reaffirmed that correspondence be secretary to secretary. A motion to affiliate with O.C.Q. was left lie on the table. Council's Model Rules for submission to the Department of Consumer Affairs for incorporation, finalised. Sub-committee set up to investigate the best insurance cover, for the Council, after incorporation. Sub-committee set up and charged with the drafting of the Council's badge and floral emblem. A.N.O.S. Northern Regional Judging Panel appointed as the official judging panel of the Council. Foundation membership of the Council to be established.

Received a generous donation from Lyn and Harry Verroen of Alick Dockrill's recent books Volumes 1 and 2. Decided to raffle them as a set, $1.00 a ticket, after the next Council meeting.

Next meeting to be held in Maryborough on the last Saturday of February, 1995.

The informality of the barbecue is a great way of getting to know fellow delegates. Delegates came from Mackay, Wide Bay, Kabi, Logan, Gold Coast, Brisbane and Toowoomba. The hospitality of the Wide Bay Group has to be sampled to be appreciated. Other groups will have difficulty in beating this when they host a council meeting.

A.N.O.S. VICTORIAN GROUP INC.

Changes in the positions of President and Secretary effective from the A.G.M., August, 1994.

President: Murray Harding. Secretary: Jeanne Dunn.

The postal address remains unchanged and the preferred method for non-urgent communication. For more pressing matters the secretary can be contacted by telephone on (03) 584-7682. ✾

— VALE —

JANNINE BANKS

With deep sadness, we advise members and friends that the wife of our well known and respected member David Banks passed away peacefully in her sleep, after a long illness, on Saturday, 31st December, 1994.

We extend our deepest sympathy to David. ✾

BOOK REVIEW

GROWING ORCHIDS IN CANBERRA AND THE OTHER COOL CLIMATE DISTRICTS
Edited by Lynne Bullivant, Sheila Cudmore and Jane Wright
Published by The Orchid Society of Canberra, G.P.O. 612, Canberra, A.C.T. 2601.
174mm x 249mm, 64 pages Paper Cover. Illustrated throughout, 26 colour photos.
ISBN 0 646 20282 0
$10.00 each plus $3.00 postage. For orders of 10 or more $8.00 per copy plus $7.00 postage.

This book is written by members of The Canberra Orchid Society and contains much information on our favourite plants, from "What Are Orchids" and "Orchid Nomenclature" to the culture of many different genera particularly from the point of view of cool to cold climate districts.

There are four chapters on our Australian native orchids:–

1. Finding Native Orchids in the A.C.T. Four pages describing four easy walks in the beautiful reserves around Canberra — one for each season.
2. Growing Terrestrials My Way. Detailed culture for cool climate districts.
3. *Dendrobium kingianum* — general information and culture.
4. *Dendrobium speciosum* — detailed culture for cool to cold districts.

A good practical commonsense chapter on "Orchids Pests & Diseases" is well worth reading.

A good book to have on the shelf for future reference, especially for those who grow their orchids in the cool/cold climate area of Australia. ✾

Reprinted from the A.N.O.S. Victorian Group Bulletin

VIRUS IN NATIVE DENDROBIUMS

Tony Slater

Over the last flowering season, a few growers noticed colour breaks in the flowers of native dendrobiums; mainly *Dendrobium kingianum* and its hybrids.

The sympotoms included irregular streaks and patches of colour on the petals and sepals, which were inconsistent from one flower to the next. Other symptoms included distorted racemes which aborted flowers before they matured and distorted leaves on new pseudobulbs. Examples of dark and light patterns on the leaves have also been noted.

Four plants exhibiting these symptoms have been tested and were found to contain a virus; although further testing is necessary to determine if this virus is the cause of the symptoms. This work will require 12 months to confirm.

In the meantime, if there are any plants which you felt were suspect this year, **do not throw them out — isolate them.** Your plants are valuable — if you would like them tested for the virus they can be done by the Department of Agriculture's Diagnostic Service at Knoxfield, telephone (03) 210-9222. A small charge is involved.

This year, when you are repotting or cleaning up your collection, clean (or preferably flame) all your tools, especially cutting implements, between plants.

If possible repot on newspaper and throw away sheets between plants.

Keep your collection as free as possible from sucking and chewing insects (especially aphids).

Please note that the symptoms DO NOT INCLUDE THE CONSISTENT RED SPOTTING OF SOME *DENDROBIUM SPECIOSUM.*

If you would like any of these details clarified contact Tony Slater, 17 Dudley Street, Mitcham, Victoria 3132. ✿

A HYBRIDIST'S STORY

Frank Simpson
29 Gannon Street,
Mt Mee, Qld. 4521

In 1974 a neighbour in Toowoomba gave me a couple of *Cymbidium* back bulbs. At the time I had a reasonable knowledge of general gardening, both flowers and vegetables, but my knowledge and interest in orchids was exactly zilch. I potted the *Cymbidium* back bulbs and they grew — quite a wonder when one considers that I potted them in ordinary potting soil. They thrived, slowly; we went to a few orchids shows and the interest began in earnest, but only in cymbidiums. It was early in 1976 before my native orchid craze began.

A friend gave me two dendrobiums — *Dendrobium aemulum* and *D. kingianum.* Not long after, I acquired Noel Jupp's catalogue and bought five seedlings at $2.00 each, these included *Parachilus* Perky and *Sarcochilus* Mavis. When one considers inflation, native seedlings certainly have not kept pace, a rise of only $1.50 in over 18 years!

I do not recall, exactly, why I bought the *Sarcochilus,* there were very few around at the time and very little cultural or descriptive information or pictures.

Probably the desire to have "something different" would be the reason. Anyway they took off, grew well and still hold numbers one and two in our Native Hybrid book.

Because these grew so well, the desire to obtain more plants led us to Wal and Jill Upton's "Double U" Orchid Nursery, where we bought *S.* Melba in 1979.

Shortly before this, I had heard about a run down collection of natives for sale. As I had been well and truly bitten by the "native orchid bug", I went to investigate but, as usual, "the vultures" had been first and the eyes had been picked out. However, in one forgotten corner, I noticed two "Sarcochilus-looking" plants and bingo, on inspection they were both *S.* Fitzhart, made by Wayside Nursery. Both were pretty sorry looking plants, dehydrated and long overdue for repotting, the best part only $5.00 for the two.

I arrived home late and proudly showed my wife, who gave me an earful for being late and promptly told me I should stop wasting money on daggy looking plants! These plants later became *S.* Fitzhart No. 1 and *S.* Fitzhart 'Wollumbin' HCC/AOC/QOS plus CCC/NMQOC and have become very important parents for us.

In 1981, many orchid growers and society members with whom I rubbed shoulders, were discussing breeding and making "new crosses". So, not to be left out, I decided to have a go myself. At the first attempt, surprisingly to me, a fair number of pods were set, on *S.* Fitzhart and to remake *S.* Fitzhart, using various clones of *S. fitzgeraldii* and *S. hartmannii* as parents. Feeling a bit adventurous a couple of *Rhynchostylis* intergeneric crosses were tried but without success. However, the pods that did take, were going along merrily and eventually the time came for them to be flasked. In due course, they germinated but grew very slowly. The chap who did the flasking for me was inexperienced with *Sarcochilus* and was experimenting with various media. Eventually the time to deflask them arrived and they grew quite well from then on.

As we had recently become a nursery, mostly cymbidiums, the public welcomed the change to *Sarcochilus*.

We were raising a young family at the time, so the dollars for flasking were scarce; particularly as cymbidiums, dendrobiums and sarcochilus needed to be flasked regularly. Costs had to come down. We discussed the situation with John Woolf and it was decided that as he had no room at his place, we would use an old "sleeve box" and locate it in a corner of our sales room. Many a long hour was spent flasking there — day after day — night after night — weekend after weekend — flasking and more flasking. As both Bev and I had quite a lot to do, bottles then became a problem. Old jam jars, re-used flasks and then soft drink bottles, which I still use today for mother flasks, etc. Now one has become spoilt with the modern polycarbonate flasks with bigger necks and the obvious advantage, being much lighter, reduced freight costs.

After being "chained" to the old "sleeve box" for a number of years I got the opportunity to break the shackles. My younger brother's ex-class mate came to see me one day — not about orchids — and when he saw me "locked into the sleeve box", he remarked: "Hell! you sure do things the hard way. My mum has one of those 'Rolls Royce' things under the house and its been there since dad died three years ago. I'm sure she'll sell it and in fact I have to ring her tonight so I'll ask her". The long and short of it was the chance came to get "modern". She agreed to sell, so we packed up and drove to the Sunshine Coast to pick up the home-made, but very well constructed, Laminar Flow Unit. We bought it for $250 and it was a very wise investment. It was made of timber with a Perspex work-box area and a white laminex work surface. Being continuously swabbed with strong chlorine, after a while, the white surface washed away. Anyone who saw me coming out of the lab., after cleaning out the unit could be forgiven for thinking I was carrying a bucket of milk. When the work surface became "doughy", it was replaced with stainless steel with a lip at the front, just like a normal kitchen sink, to keep the chlorine where it belongs — off my clothes. I rarely get those tell-tale white, bleached out, spots on my clothes now and it is not so obvious I have been flasking.

Everything went along well for quite a while in my "new lab.". It was located inside the bricked-in stand on which the water tank stood, but somewhat restricted for space, in fact, if I had let my hair grow a bit longer than usual, it would have brushed the ceiling — there was no way I could wear a "Bell Topper" in there. Contamination was quite a rare event, even though I always worked with the door open.

A few weeks before our big move to Mt Mee, disaster struck. Like many orchidist we had problems with our neighbours trees, you know, those that always manage to steal your sun! Strangely, our tank stand, I mean lab., was like so many others, it had a tank on top, complete with strainer to catch leaves, etc. and that is exactly what it did, only there would have been a bucketful, so it became blocked.

At 2.30 a.m. a very heavy storm — (Oh for one now!) turned our lab. into a raging waterfall, gushing through switched on lights, flasks of seedlings and everything else that got in the way. It will always remain a mystery why the whole place did not blow sky high!

It was a very costly exercise in more ways than one. All flasks had to be boxed for "the move" very soon after this disaster. On opening the flasks a few weeks later, the contamination had to be seen to be believed — probably about an 80% loss. A two-way loss, both in dollars and years of work. Anyway, my lab. at Mt Mee, will not flood; in fact it has 2m of water under it. This time **on top of the tank!** and more room, I do not have to keep my hair short, the ceiling height is the normal 2400mm high.

A few "heavy" breeding years (with *Sarcochilus*) and things are pretty well back on track, we have a good back-up stock of *Sarcochilus* mother flasks on hand and some exciting stuff in the pipeline. Time surely flies and when one leasts expects it, a new hybrid flowers for the first time.

Back to the toothpick. An early theory was that *S.* Fitzhart made a good parent, because of its size and shape plus its ease of culture. Probably the desire to do something "different" made the decision to use *S.* Fitzhart as it had not been used before. I had obtained my first *Sarcochilus* species *S. spathulatus* (Plate 16) (*Parasarcochilus spathulatus*). The idea of *Parachilus* Tigress (Plate 17) was born. Nothing startling shape-wise, but good colours came through with very heavy markings, golds, reds and even pinks, plus some green backgrounds, I was somewhat deflated because of lack of shape, so things were put on hold for a while until one day I decided to put *P.* Tigress back on to *S.* Fitzhart 'Wollumbin', that was 22/10/1985 and this was the start of *Parachilus* Tigersun. When the seedlings began flowering both size and shape were good and the colours maroon/red, gold, brown and green, very attractive.

Unfortunately most of the seedlings were sold when small, the six or so I kept have produced a number of awards. The first was *P.* Tigersun 'Kwokka' HCC/AD/NMQOC (Plate 20) (because of a few judging problems it was only put up before North Moreton Council) it was also awarded Orchid of the Year 1992. Next to flower was *P.* Tigersun 'Wollumbin' AD/AOC/QOS (Plate 21) and was awarded North Moreton Council AD of 1993. *P.* Tigersun 'Brutus' HCC/AD/QOS/NMQOC (Plate 19) has been awarded this year, the AOC award is not yet known. A couple of crosses between selected clones was attempted but I lost the pods in the January heat. A remake made last year produced a very few seedlings, so it has been attempted again this year.

One thing that has always puzzled me is why *Sarcochilus falcatus* was largely ignored by the early breeders. It has so much going for it:-

1. The progeny flower on very small plants.
2. It has the ability to intensify colour in its progeny, through its gene bank.
3. Progeny are usually easy to grow.

We have used it fairly extensively and have quite a few coming along at various stages. One hybrid that produced colour is *S.* Tiffany (Plate 18).

Another breeding aspect overlooked by some hybridists is with the smaller species, *S. ceciliae* being the exception, but even it has not been over used. I feel, although the hybrids are not great on shape, they are usually very colourful.

S. weinthalii has tremendous potential and although it is 24 years since *S.* Weinhart was registered, the small number of registrations with this beautiful parent, until the last few years, is very few. When we registered *S.* Peach Spots in 1991 something started. We will surely have more in the near future.

Another species is *S. dilatatus* and this has only been used a couple of times but with great results. In the 1992 season I used it quite extensively and set a number of pods, only to lose them to bush rats, they cost me my parent plant too, now we have to wait for deflasked plants to grow and flower.

I feel that many of our tiny species, allied to *Sarcochilus*, are a wealth of untapped beauty, particularly when crossed with larger hybrids and species. The next five years or so, will be something to look forward to in the *Sarcochilus* world. ✤

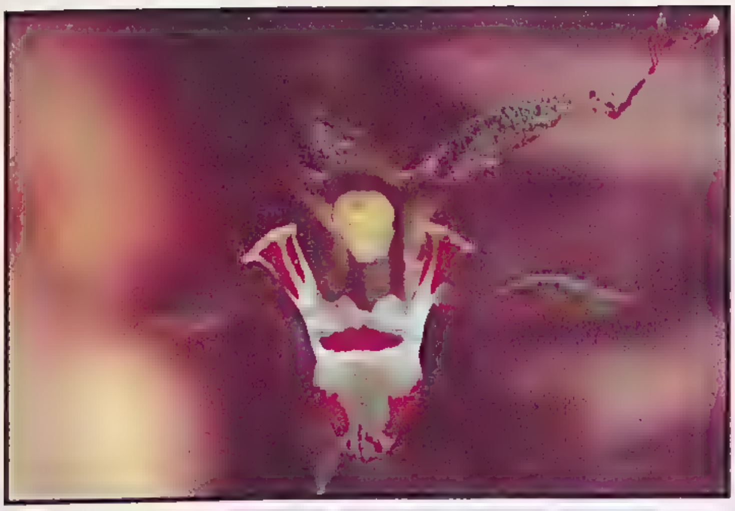

Plate 16: *Sarcochilus spathulatus.*

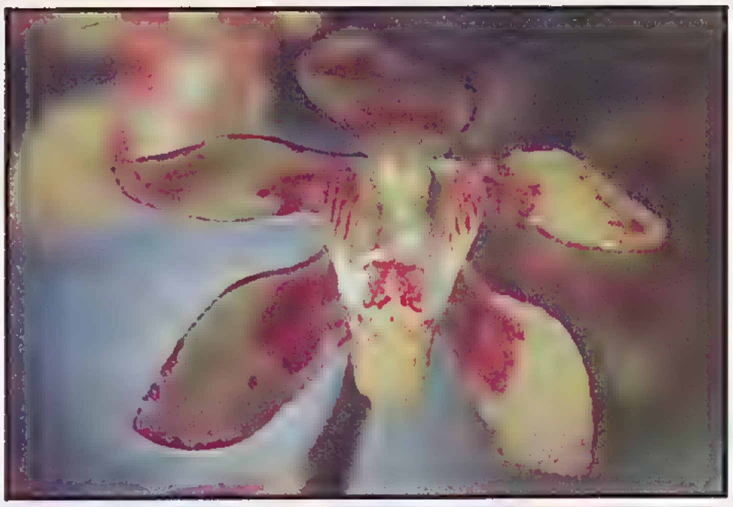

Plate 17: *Parachilus* Tigress No. 1.

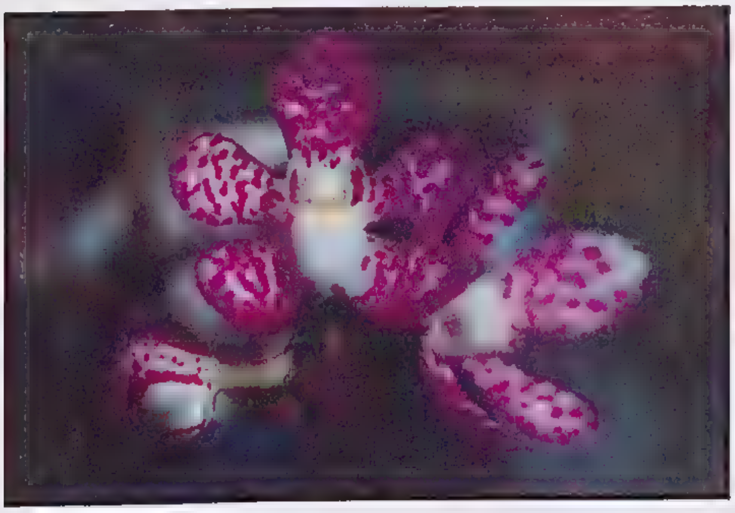

Plate 18: *Sarcochilus* Tiffany.

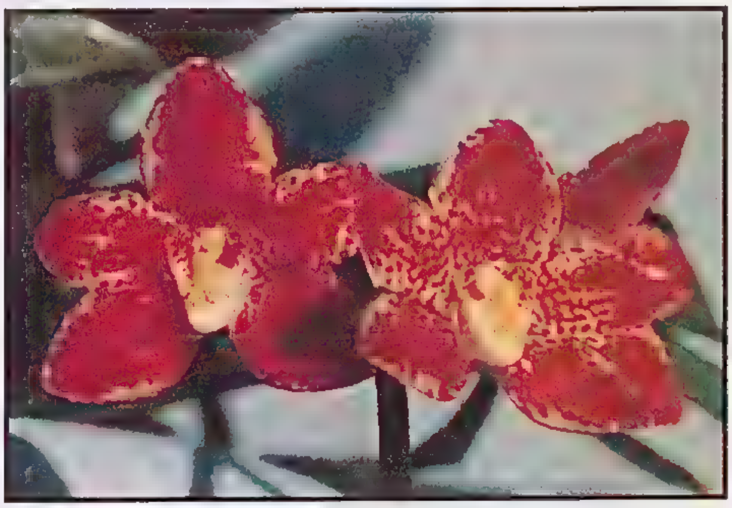

Plate 19: *Parachilus* Tigersun 'Brutus' HCC/AD AOC/QOS/NMQOC.

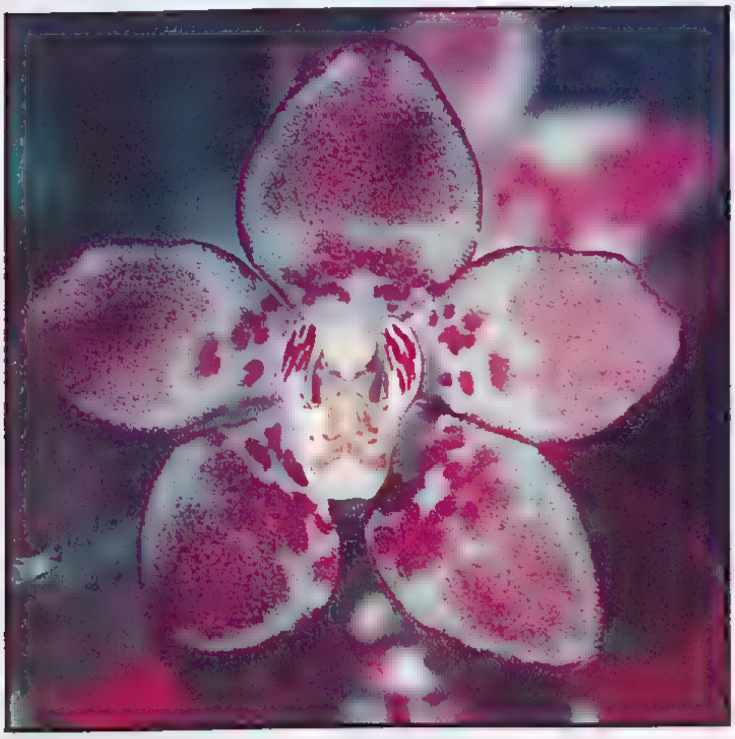

Plate 20: *Parachilus* Tigersun 'Kwokka' HCC/AD NMQOC.

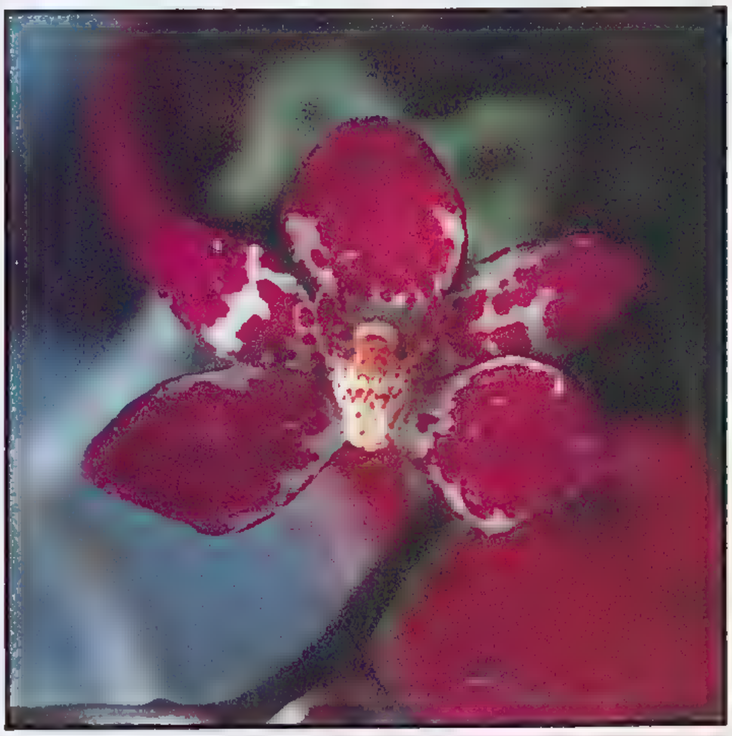

Plate 21: *Parachilus* Tigersun 'Wollumbin' AD AOC/QOS/NMQOC.

Photos by F. Simpson.

SHOW REPORTS

A.N.O.S. VICTORIAN GROUP INC.
Spring Exhibition 1994

Ken Roberts, Publicity Officer

Victorian Group staged its Annual Spring Exhibition at the Holmesglen College of TAFE (Plate 22), Glen Waverley Campus (formerly the Victorian Schools Nursery) on the 1st and 2nd of October, 1994.

Our new venue, in its lovely garden and nursery setting, posed several new challenges for the Show Committee — how to attract the public to the venue and how best to utilise it to improve the overall presentation and public viewing.

The complex, which comprised a large well-lit auditorium opening out to a sheltered courtyard with adjacent rooms, provided all the desirable basics. It permitted a far more spacious layout than had been possible at the Herbarium; wide aisles provided the public with excellent access to all of the displays. Restricting the height of the displays to only two tiers allowed close-up viewing of all orchids.

Potting demonstrations, potting media displays and sales were accommodated in the courtyard while plant sales were separate from the main display in a spacious adjacent room.

Popular species such as *Dendrobium kingianum* (Plate 24) and hybrids such as *D.* X*delicatum* (Plate 27) and *D.* Bardo Rose were displayed on separate tables to permit easy comparison and highlight diversity of flower shape, colour, etc.

The result of all these efforts? A resounding success! The public particularly appreciated the wide aisles, improved viewing and the interesting educational demonstrations and displays (Plates 23 and 25). The well organised sales area could not cope with the demand for quality flowering plants.

Despite a tricky start to the season, with a very cool September in Melbourne, the displays were magnificent and a credit to all those members who contributed their time and effort. The only species in short supply was *D. speciosum*, which was having a rest from flowering in Melbourne during 1994.

While our Society is non-competitive, perpetual prizes are awarded for outstanding cultural achievement at spring exhibitions — this year's winners were:–

The Phil Mim's Prize for the Best Cultivated Terrestrial
Helen Richards for her *Thelymitra epipactoides*

The Bill Murdoch Prize for Best Cultivated Epiphyte
John Evans for his *Dendrobium striolatum* (Plate 26)

The Dingley House and Garden Prize for Best Cultivated Hybrid
Ray and Dot Smith for their *Rhinochilus* Dorothy.

A total of 17 Cultural Certificates were also awarded for other outstanding exhibits.

Our sincere thanks go to the members of the Show Committee: John Evans (Convenor), Ted and Marg. Elgood, Godfried Oesch, Peter Nash and Murray Harding for their tireless efforts during the lead up to and the staging of the exhibition. Also the keen participation of our new members group was greatly appreciated. ✻

A.N.O.S. PORT HACKING GROUP
3rd Annual *Sarcanthinae* Show

Bob Napier

The Group's third *Sarcanthinae* show was held at Heathcote on Sunday, 30th October, 1994. There were in excess of 230 entries including over 40 from Ken Russell, who travelled with Noelene and Reefer all the way from Dungog, after competing in a bowls tournament on the Saturday, still arriving before 8 p.m., surprisingly without an escort of white commodores.

Most classes were well supported. One class will have to be split up into three classes next year, as almost 100 plants in one class makes judging difficult, especially as one judge remarked that there were four or five potential prize winners in that class.

The major winners were:–

Champion Orchid of the Show and Champion Australasian Species — *Sarcochilus hartmannii* exhibited by N. Roper.

Champion Australasian Hybrid — *S.* Melba exhibited by K. Wilson (A seedling incidently with one damaged bloom, so watch out next year!).

Neville Roper seemed to have dominated the prize list with Kevin Wilson running a close second. Ken Russell exhibited some very interesting species and hybrids which were very high in the popularity stakes with the public.

Col Brandon's comparative lack of success, is obviously his plants punishing him for taking an extended overseas trip recently. The Wood family made their mark as usual.

The A.N.O.S. Judging Panel under Darryl Smedley, consisting of six full judges and two carrying "P" plates, did their usual sterling talk and had time for friendly, repeat friendly discussion afterward with some of the exhibitors, from which, I think all of us learnt something, thanks.

The venue at Heathcote has problems and does not attract the visitors we were getting at Yarrawarrah, this will need some discussion, convenience versus commerce. ✻

SYDNEY GROUP SPRING SHOW

Gerry Walsh
7 Leslie Court, Werrington, N.S.W. 2747

The A.N.O.S. Sydney Group held its 12th Annual Spring Show at the Baulkham Hills Community Centre on the 17th and 18th of September, 1994 and, predictably, it was a resounding success. This was depite the benches attracting only three-quarters of their usual quota of plants.

The weather was the culprit for the shortfall in numbers. High temperatures in early September promised a great show of flowers but by the week leading up to the big weekend the mercury had plunged and the winds blew non-stop. This culminated in many of our native gems not knowing whether they were Arthur or Martha and they responded accordingly. But while numbers were down, quality was certainly easy to spot.

People entering the sanctity of the hall were immediately captivated by a beautiful, large flash of white on the wall. The species was *Phalaenopsis amabilis* var. *rosenstromii* (Plate 33) and its owner was Michael Harrison. This plant went on to take out Champion species of the show and I must say that rarely have I seen such a deserving champion as this one.

This orchid is a product of Mike's own line breeding using his *P. amabilis* 'Moonshine' AM/ANOS/1990 as one parent and Darryl Smedley's *P. amabilis* 'Lunar Glow' as the other. Both of these parents are in fact nursery bred seedlings themselves, so that Mike's champion is acutally a second generation clone. This fact no doubt adds considerably to his achievement and his pride.

One 75cm long, beautifully arching raceme supported 13 fully open flowers up to 80mm diameter. Colour, shape, habit, size, you name it — this plant had it all! Hopefully this clone will be graced with a distinctive clonal name before long.

Champion Hybrid went to a mature specimen of *Dendrobium* Yondi Sparkle (Plate 31) belonging to Alan Ferrie. Crisp, clean yellow blooms nicely arranged on medium length semi pendulous racemes were the hallmarks of Alan's plant. Very well flowered with plenty of blooms all over it meant that this was indeed a champion orchid.

Darryl Smedley took out the Annual Don Barnham Award for the Champion Specimen Species with a magnificent clump of *D. canaliculatum* bursting forth with around 25 long racemes in the peak of condition. Not a big clump by any menas but big where it counted — number of racemes and flowers on board.

A large plant of *D.* Aussie Cascade (*D. schoeninum* X *D. pugioniforme*) was always going to be a contender for Champion Hybrid Specimen. The award was duly conferred and Phil Spence was the happy recipient.

In the terrestrial sections, Eric and Jim Smith benched several pots of high quality plants. Champion Terrestrial went to their fantastic display of *Glossodia major*. Six quality blooms growing to perfection graced this exhibit and the beautiful purple colour stood out above all else in the terrestrial arena.

Finally, the collection of *Dendrobium speciosum* benched this year was possible the finest assemblage of high class "rock lilies" seen in this most competitive section for several years. Quality was second to none and the judges finally chose David Butler's specimen of *D. speciosum* 'Charlie' AM/OSNSW (Plate 34) as the pick of the 20 or so plants present.

On the Saturday night of the show we were privileged to have as our guest speaker the most recognisable and respected name in Australian orchidology, Mr Alick Dockrill. Alick treated the 90 or so scholarly enthusiasts to a solid three hour lecture on a vast number of Australian tropical species. He was kept rather busy meeting and talking with the many admirers who had gathered about him. Also, Alick was happy to autograph copies of his authoritative books, both old and new, on Australian indigenous orchids. He struck me as a most knowledgable and humble man and I, like everyone present, will never forget that enlightening evening.

The Sydney Group Spring Show has now become the premier native orchid show in Sydney. This in no way infers that other shows are not wonderful events — far from it! It's just that our show attracts more growers, more plants and more **quality** plants, than the other shows are able to muster up these days. Full credit to the Sydney Group committee and the show committee for the big effort and the rewards thereof. ✾

WOLLONGONG & DISTRICT NATIVE ORCHID SOCIETY

Show Report 3rd Annual *Sarcanthinae* Show

Bruce Porter

Our show this year was held over a three day period in the main shopping area of Wollongong, in a vacant shop kindly loaned to us for the period of the show by our busy Treasurer Graham Slater.

We had more than enough room to display exhibitors plants (370 in 30 sections) and our raffle and sales table. Local media advertising and our central location attracted many visitors and the public were greatly interested in the show.

The show attracted a good mixture of plants — *Sarcanthinae, Dendrobium* (both section *Dendrocoryne* and terete), *Bulbophyllum*, *Cymbidium* and terrestrial. There were many newer *Sarcanthinae* hybrids showing great potential expecially *Sarcochilus* Bobby Dazzler. The six special prize winners are listed below but there were also many interesting and well grown plants that made up the 1st and 2nd places in each of the 30 sections.

Grand Champion: *Dendrobium monophyllum*, Ron Wheeldon

Reserve Champion: *Cymbidium* Little Black Sambo, John Hynds

Champion *Sarcochilus* Species: *Sarcochilus hartmannii* (*S.* Red Brown X *S.* Red Snow), Ron Wheeldon

Champion *Sarcochilus* Hybrid: *S.* Cherie, Albie and Thelma King

Best *Sarcanthinae* Species Seedling First Flowering: *S. hartmannii*, Tom Gray

Best *Sarcanthinae* Hybrid: *S.* Cherie, Albie and Thelma King.

AROUND THE SHOWS

Plate 22: Holmesglen College of TAFE.

Plate 23: Ted and Marg. Elgood's orchid reproduction display.

Plate 24: John Evans with epiphytic species and hybrids.

Plate 25: Display by Ted and Marg. Elgood.

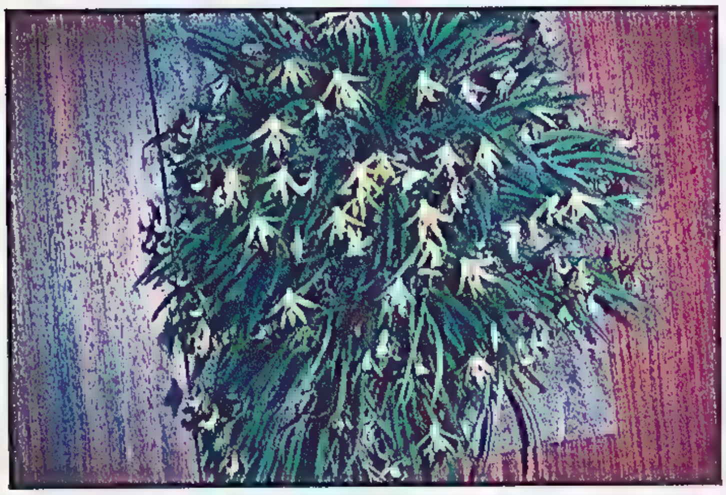

Plate 26: *Dendrobium striolatum.*

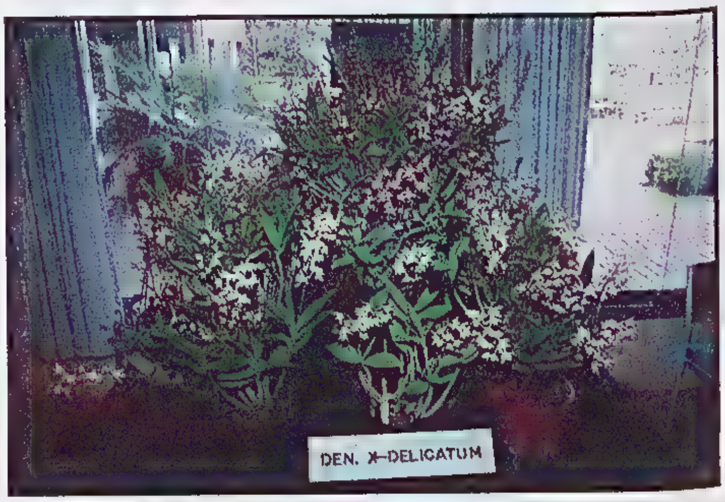

Plate 27: Display of *Dendrobium* X*delicatum.*

Photos by K. Roberts.

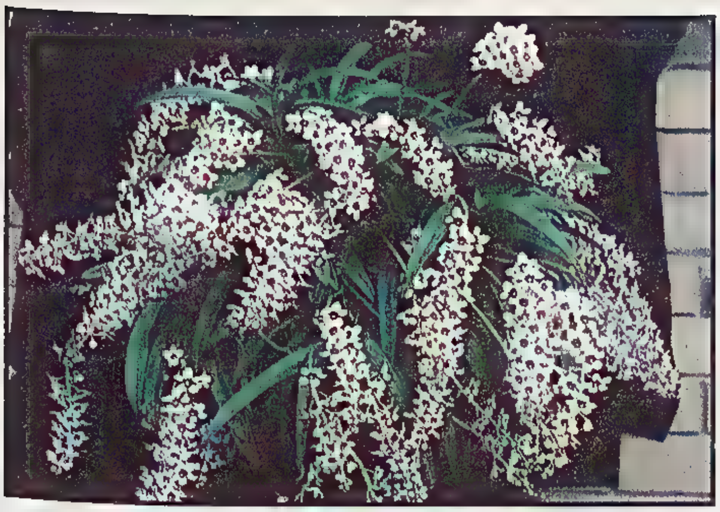

Plate 28: *Sarcochilus hartmannii.*
Photo: Kevin Cummins.

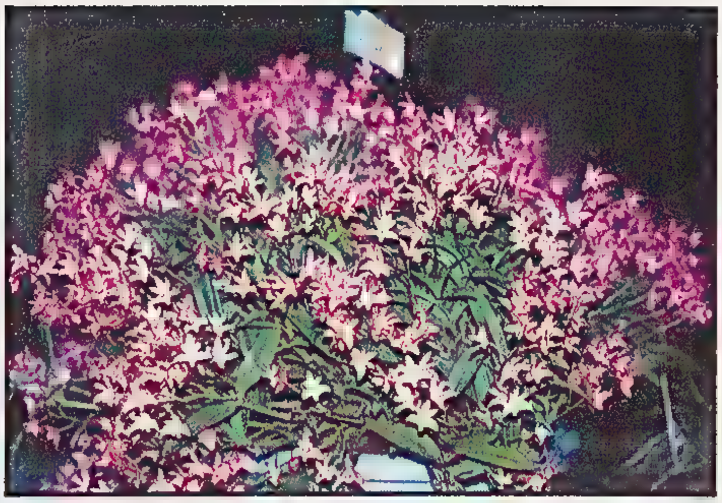

Plate 29: *Dendrobium* Bardo Rose.
Photo: Kevin Cummins.

Plate 30: Display by D. Butler and B. Fletcher.
Photo: D. Titmuss.

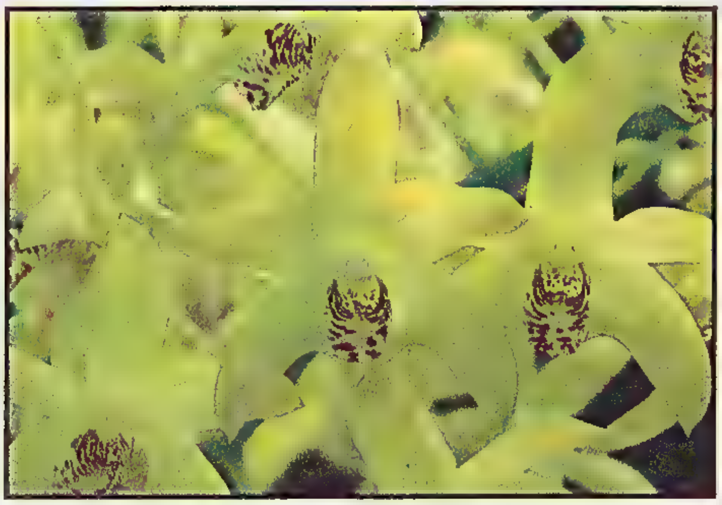

Plate 31: *Dendrobium* Yondi Sparkle.
Photo: D. Titmuss.

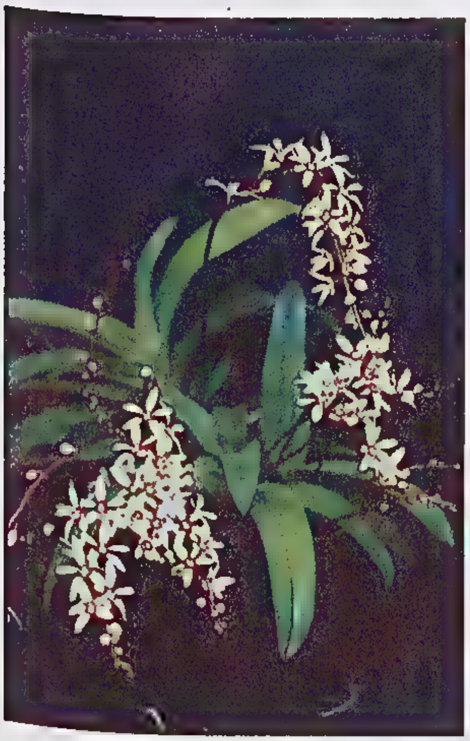

Plate 32: *Sarcochilus* Canary X *Rhinochilus* Dorothy.
Photo: L. Fagg.

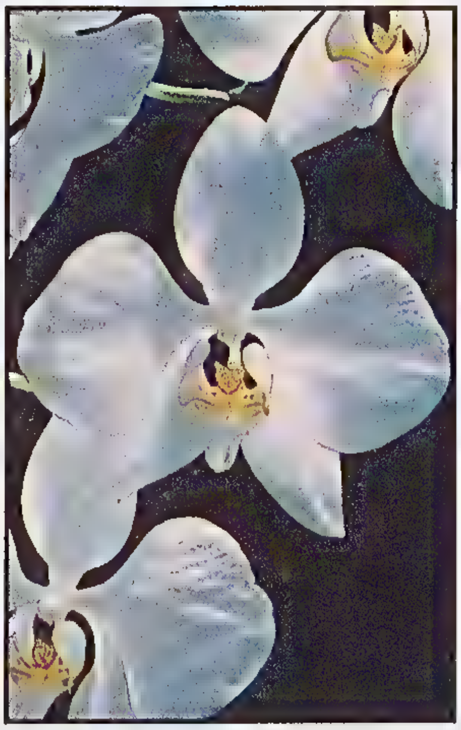

Plate 33: *Phalaenopsis amabilis* var. *rosenstromii.*
Photo: D. Titmuss.

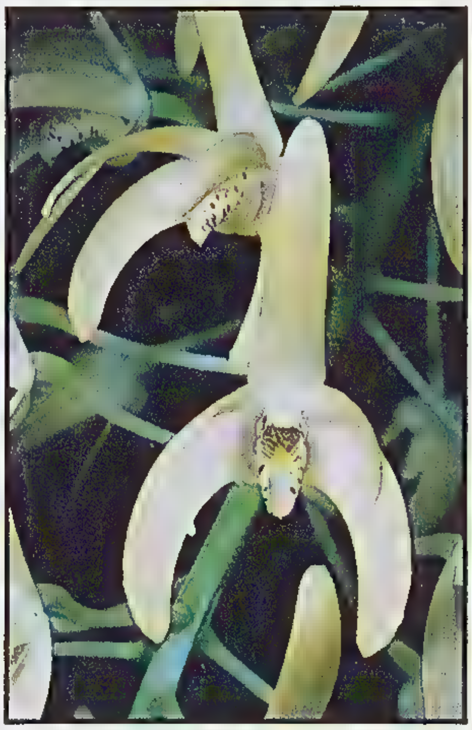

Plate 34: *Dendrobium speciosum* 'Charlie'. Photo: D. Titmuss.

The Committee were grateful for all those who attended, exhibited and helped at the show and appreciated the time put in by the judges. A special thanks to our sponsor Pacific Power. ✻

A.N.O.S. GEELONG GROUP
Annual Show 1994

Everett Foster
1 Elizabeth Street, Belmont, Vic. 3216

The annual show of the A.N.O.S. Geelong Group was held over the weekend of 5th and 6th November and presented a fine display of Australian native orchids. The show mainly featured the genus *Sarcochilus;* an excellent display, showing all those viewing how beautiful this genus is. Some of the plants were in very large pots and grown to perfection. Visitors to the show consistently expressed their appreciation of the orchids on display to the members on duty. On the Sunday, wild wind storms lashed the area and this, unfortunately, affected the attendance.

The Grand Champion Orchid of the Show was awarded to a *S.* Canary X *Rhinochilus* Dorothy (Plate 32) owned by Lorraine Fagg. This superb plant, which carried approximatley 12 long, many flowered racemes of large, wide open and flat flowers, has been awarded a Silver Trophy by the Ira Butler Trophy Committee and has since received an Award of Distinction from the Victorian Orchid Club.

The Reserve Champion of the Show was awarded to a *Sarcochilus* Fitzhart owned by Kevin Cummins; this plant has been recommended for an Award of Merit.

The standard of the show is clearly seen from the two very florific plants shown in Plates 28 and 29 taken by Kevin Cummins of his own plant of *S. hartmannii* which won first prize in the *S. hartmannii* Section and Les Dale's plant of *Dendrobium* Bardo Rose, the Champion *Dendrobium* of the Show. ✻

A.N.O.S. NEWCASTLE GROUP
Sarcanthinae Show

Peter Presland, Show Marshall

The Group's annual *Sarcanthinae* show was held at Lake Macquarie Fair Shopping Centre, Mt Hutton from the 20th to 22nd October, 1994.

Another very successful show, 176 entries from 19 exhibitors. Most of the classes were well represented, with the largest number, over 40 entries, being in the *Sarcochilus hartmannii* class.

There were several large specimen plants in the display, mainly *Dendrobium* Ella Victoria Leaney in the *Dendrobium* hybrid class.

Some of the novelty type *Sarcochilus* hybrids caught the eye with their brilliant colours, although these plants were small, they will be magnificent in years to come.

Major prize winners, showing plant awarded and owner, were:–

Grand Champion and Champion Native Hybrid: *S.* Fitzhart, Marie Simpson.

Champion Epiphytic Species: *S. hartmannii,* Jack McMillan.

Champion Deciduous Terrestrial: *Diuris sulphurea,* Peter Presland.

Champion Novice: *Sarcochilus hartmannii,* Rick Thompson.

Champion Specimen: *S.* Weinhart, Tony Clarke.

I would like to thank all who exhibited their plants, those who helped with the manning of the show for the three days, the management of Lake Macquarie Fair for their help and for allowing us to stage the show in their shopping centre and the A.N.O.S. judges who gave up their time, Darryl Smedley, Ian Slade and Jim Lykos. ✻

SARCOCHILUS FESTIVAL OF VICTORIA

Frances Wilde

Maribyrnong Orchid Society held their third annual *Sarcochilus* festival of Victoria on 28th–30th October at Werribee Plaza Shopping Centre, Heath's Road, Werribee.

As is usual for this very progressive Society that has a high percentage of members very interested in Australian native orchids, a brilliant display of orchids was presented to the public and orchid hobbyists alike. The management of this shopping centre have made us very welcome at their venue and have provided the winner of the Champion *Sarcochilus* of Victoria with a shopping voucher to the value of $250 each year.

Again this year, many exceptional *Sarcochilus* and *Sarcochilus* intergeneric crosses were presented by members for display — the major winners of the Champion *Sarcochilus* of Victoria were Jim and Margo Lattimore with their plant of *S. hartmannii* Kerrie, Champion Hybrid *Sarcochilus* going to *S.* Heartlight owned by Eric and Frances Wilde and Champion *Sarcochilus* Specimen went to Lorraine Fagg for her *S.* Canary X *Rhinochilus* Dorothy (Plate 32). The *Sarcochilus* Heartlight and *S.* Canary cross were from hybridist Ken Russell.

For members who did not have any *Sarcochilus* out this season (flowering is a little slow this year in Victoria) there was also a general benching of other genera and the winners of this section were Brian and Phyllis O'Neill with their beautiful *Dendrobium* Adastra, which also received a club cultural certificate.

This festival is open to **all** growers of *Sarcochilus* in Victoria to enter. In the inaugural year 1992, the winners were non members of Maribyrnong Orchid Society in Peter and Sheryl Adams with their *S. hartmannii* Mt Lindesay HCC and last year in 1993 members Jim and Margo Lattimore won with a beautiful *Sartylis* Blue Knob 'TJ' which also received a HCC/VOC/AOC.

Next year this festival will be held at our club rooms at Maribyrnong where we hold our other shows, so all Victorian *Sarcochilus* growers get ready to invade us during this festival.

Enquiries to Maribyrnong Orchid Society Inc., P.O. Box 148, High Point City, Victoria 3032 or phone (052) 83-1364 (Show Co-Ordinator). ✻

A REINSTATEMENT OF *RHOMBODA* LINDL. (*ORCHIDACEAE* SUBTRIBE *GOODYERINAE*)

Paul Ormerod
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ABSTRACT

Rhomboda Lindl. is reinstated and its generic affinities, generic limits and characteristics discussed. *Hetaeria* Bl. Section *Pleurorchis* Bl. and *Zeuxine* Lindl. Section *Hetaeriopsis* Schltr. are reduced to synonymy under *Rhomboda.* An emended generic description is provided. Excluded species are listed after the main treatment. Seventeen new combinations are proposed: *R. abbreviata, R. alticola, R. angustifolia, R. atrorubens, R. bantaengensis, R. cristata, R. lanceolata, R. luzonensis, R. minahassae, R. moulmeinensis, R. novae-hiberniae, R. pogonorrhyncha, R. polygonoides, R. taiwaniana, R. velutina, R. weberi* and *R. yakusimensis.* Four new species and one new variety are proposed: *R. alticola* var. *finisterrae, R. confusa, R. dennisii, R. fanjingensis* and *R. wardii.*

During my six years research on the orchid flora of the Bismarck Archipelago, north-east of New Guinea, I came across an orchid which did not seem to belong to the genus in which it was placed. That orchid, *Zeuxine novae-hiberniae* Schltr., spurred me into persuing a broader generic investigation to determine its correct place. The result is the following treatment.

The monospecific genus *Rhomboda* was proposed by the great orchidologist John Lindley in 1857. Miquel (1859) added *Hetaeria lamellata* Bl., but later authors appear not to have accepted Lindley's genus. Bentham (1881) sunk it into *Hetaeria* Bl., conversely J. D. Hooker (1890) transferred the original species to *Zeuxine* Lindl. The last evaluation of *Rhomboda* was published by Tang and Wang (1951), who included it in *Odontochilus* Bl., overlooking that *Rhomboda* has one year priority over the latter.

The other species treated here within *Rhomboda* have also had a chequered taxonomic history. Because they superficially resemble various taxa of *Hetaeria* and *Zeuxine*, most of them are to be found residing in these genera. Alternatively, Seidenfaden (1978), following on from Tang and Wang (1951), has placed some *Rhomboda* species in *Anoectochilus* Bl. sensu lato, of which *Odontochilus* is regarded as a synonym.

I have therefore found it necessary to provide a brief definition of the generic characters of *Anoectochilus, Hetaeria, Odontochilus, Rhomboda* and *Zeuxine.* It must also be noted that *Anoectochilus calcaratus* (J. D. Hook.) Ridl., often cited as intermediate between *Anoectochilus* and *Odontochilus,* has proven to belong to *Pristiglottis* Cretz. and J. J. Sm. (Ormerod, in prep.).

Anoectochilus. The cylindric to conical, exserted spur at the base of the labellum immediately distinguishes this genus from the following four. Three peloric species without such a spur are known.

Hetaeria. The inverted, non-resupinate flowers normally indicate this genus. Most species have a large labellum hypochile which is saccate at the base and with two or more internal basal appendages each side. The epichile is usually small with a few exceptions. Near the apex of the column there is usually a lateral wing or fleshy process each side. The rostellum is often prominent and fleshy.

Odontochilus. The prominently pectinate flange on the claw of the labellum places this alongside *Anoectochilus*. The labellum has a small saccate hypochile, a long claw and a normally bilobed epichile.

Rhomboda. Similar to *Hetaeria* in overall flower structure, but the flowers are normally resupinate at an angle. The labellum has a large basally saccate hypochile with only one internal basal appendage each side. Furthermore, toward the apex of the hypochile is a medial bicarinate, dome-shaped callus. On the exterior of the hypochile is a fleshy flange which more or less runs parallel to the upper margin of the hypochile; rarely is it perpendicular to this. The epichile is usually small but well developed in a few species. The column has two large medial rather than lateral wings which run to its base. The rostellum is short and broad.

Zeuxine. Flowers generally resupinate, sometimes at an angle. The labellum has a hypochile, claw and epichile which are usually of similar length. The hypochile is saccate with one to few internal basal appendages each side. The claw is normally unadorned, but a few species have a plain lateral flange. The epichile is usually broader than long.

As can be seen from the brief definitions of the above five genera, it has been necessary often to speak in general terms. This is because there are a few species in each genus which have atypical features. It is also the reason why I have preferred to note their characters in this way rather than in a key which would be quite complicated and lengthy.

I regard *Rhomboda* as a close relative of *Hetaeria* because they share a similar labellum structure. Some *Zeuxine* species have a column similar to *Rhomboda* but do not agree very well in features of the labellum. I would therefore place *Zeuxine* as the second closest relative of *Rhomboda.* The relationship with *Anoectochilus* and *Odontochilus* appears to me to be quite distant especially as these two genera have a rather dissimilar column and labellum structure.

Rhomboda **Lindl.** J. Linn. Soc. Bot. 1:181, 1857.
Type: *Rhomboda longifolia* Lindl., l.c. Type: India, Sikkim, Hooker 335 (holo. K!, icon K!, K-LINDL!).
Synonyms: *Hetaeria* Bl. Sect. *Pleurorchis* Bl., Orch. Arch. Ind.:86, 1858.
Type: *Hetaeria cristata* Bl., l.c. Types: Java – Gede, Tjiburrum and Gagarbintang, Blume S.N. (syn. L n.v, iso. BM!, K!).
Zeuxine Lindl. Sect. *Hetaeriopsis* Schltr., Fedde Rep., Beih. 1:77, 1911; Fedde Rep. 10:11, 1911 nom. nud.
Lectotype (designated here): *Zeuxine novae-hiberniae* Schltr., Fedde Rep., Beih. 1:82, 1911.
Type: New Ireland – near Punam, 600m, 07-1902, Schlechter 14695 (holo. B – destroyed, iso. BM!, BR, BRI!, K!, NSW!, P, W.).

Terrestrial, rarely epiphytic tender herbs, 10–60cm high in flower. **Rhizome** creeping with fleshy, villose roots at the nodes. **Stem** erect, with ± foliose sheaths at the nodes which may or may not wither, 2–5 leaved at the apex. **Leaves** 2–20cm long, obliquely lanceolate, ovate, oblong, elliptic-suborbicular, acute, coloured green-red often with bronze-red suffusion, the median line often striped white-red, the base petiolate then dilating into a membranous sheath which embraces the stem. **Inflorescence** terminal, to 40cm long, laxly few to densely many-flowered, sparsely-laxly pubescent with 1–3 sheathing bracts; floral bracts externally sparsely-laxly pubescent, margins entire to ciliate, acute, often subequal in length to the mature pedicel with ovary. **Pedicel** with **ovary** glabrous to sparsely pubescent, often attenuated at the base and apex. **Flowers** resupinate at an angle or non-resupinate, globular, subnutant, glabrous to sparsely pubescent, not opening widely, tepals 3–8mm long, sepals coloured green-red often with reddish suffusion, petals translucent white, labellum with white epichile, hypochile white or partly yellow-orange, pollinia yellow. **Sepals** ovate-elliptic, laterals often spreading widely and slightly narrower, acute. **Petals** forming a galea with the dorsal sepal, often broadly dilated with the upper margin straight, acute, membranous. **Labellum** 3–4 lobed, to 8mm long; hypochile forming ½–¾ length of labellum, up to ⅓ connate with column margins, with one oblong, rhomboid to transversely elliptic, thin to fleshy, entire to minutely denticulate basal appendage each side; divided longitudinally by a low carina which raises in the apical ¾ into a thin to fleshy bicarinate, dome-shaped callus; exterior with a smooth to rugose, thin to fleshy flange which runs ± parallel with the upper hypochile margin, rarely perpendicular to it; side lobes or front margins when spread flat truncate to forward pointing, rounded, often inrolled or overlapping; claw none or short, formed by the inrolled margins of the epichile base, the exterior flange may terminate at its base or along its length; epichile sessile to clawed, small to large, entire to bilobed, variously shaped, apiculate. **Column** with a narrow base then strongly dilated, thus forming a large clinandrium to which the ovate-cordate anther is basally attached and imbedded; wings close together, beginning beneath the rostellum and between the stigmas, ending before the base of the column or at its very base and thus partially attached to the labellum, often strongly dilated distally; rostellum thin, broad, deltoid, bifid, acute; stigmas 2, on the apical corners of the column, sometimes partially joined, ellipsoid-circular, rugose, the infundibuliform bases united to and disappearing into the column; pollinia 2, clavate, deeply grooved, soft, sectile with attenuate bases joined on a small gland.

Distribution: about 22 species in Bhutan, Nepal, north-east India, south-west and south-east China, Burma, Thailand, Japan, Taiwan, Philippines, Malaysia, Indonesia, New Guinea, Solomon Islands, north-east Australia.

The raised bicarinate callus on the hypochile has been noted as entire in two species by some authors (J. D. Hooker 1894, Seindenfaden 1978:f.18); this is an error of observation. Internal lamellae on the side of the hypochile shown by Seidenfaden (1978:f.19) is probably an error, instead representing the external flange which can be seen through the membranous margins of the hypochile. I have made this error in drawings myself. *Rhomboda wardii* has a very thin membrane, which is partially free on the outside of the column wings. I have excluded this unusual feature from the generic description.

The thin or fleshy nature of parts of the flower dictate that caution is required in interpreting the shape or structure of those parts which are difficult to rehydrate fully or damage in pressing.

Rhomboda has not been recorded from Indo-China or the Moluccas. Possibly plants ascribed to *Hetaeria pauciflora* Ridl. (See Seidenfaden 1992) from Vietnam will turn out to belong here.

The species are arranged in an west to east fashion. No attempt has been made to produce a key because of the perplexing similarity of taxa separated by great geographical distances. In attempting to identify plants, students should first know the species in their area and proceed from there.

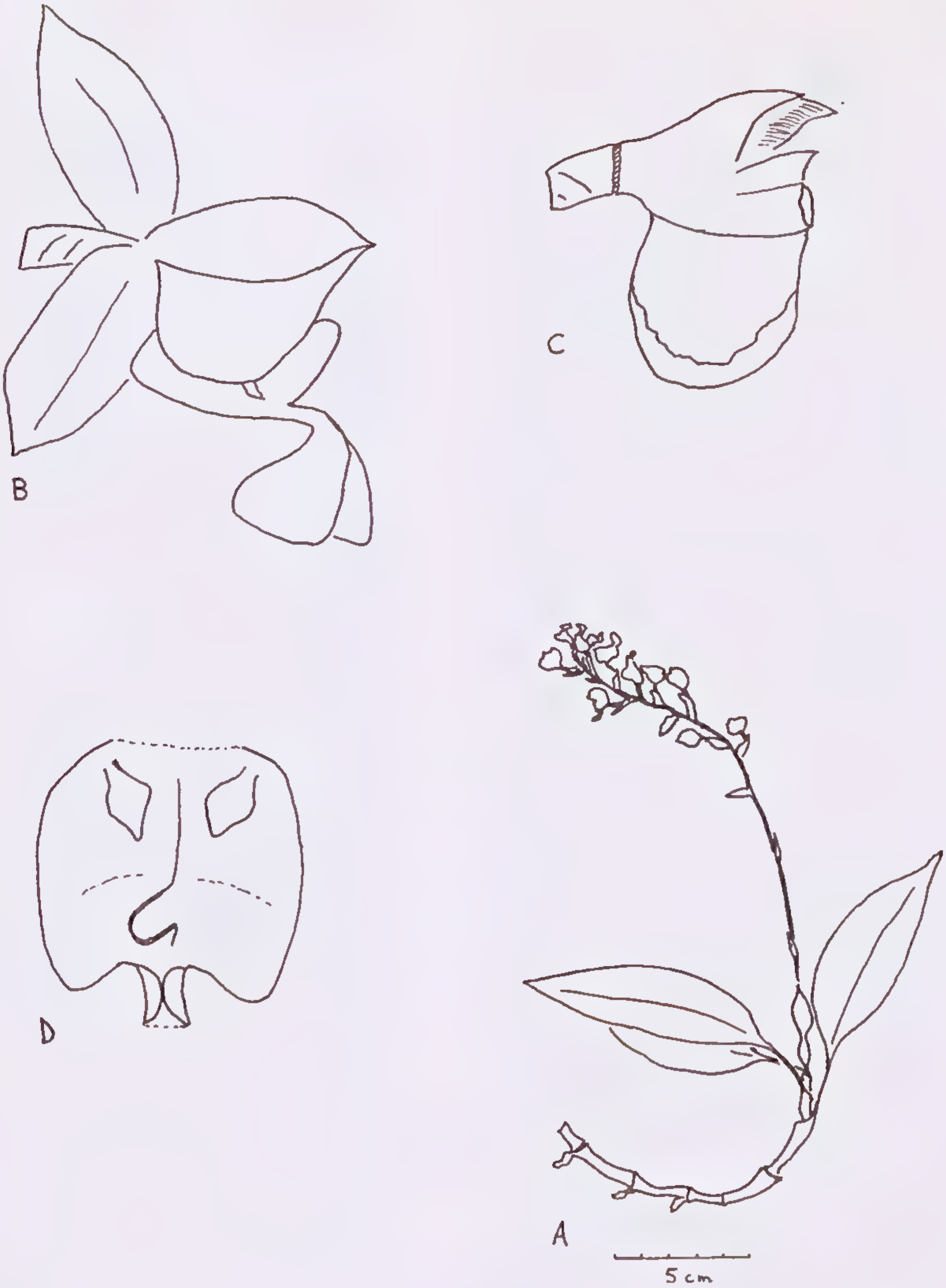
The term mf (=microfiche) refers to material viewed on that medium.

Rhomboda longifolia **Lindl.,** J. Linn. Soc. Bot. 1:181, 1857.
Syn: *Hetaeria longifolia* (Lindl.) Benth. ex J. D. Hook., Fl. Brit. Ind. 6:109, 1890 pro syn.; *Zeuxine longifolia* (Lindl.) J. D. Hook., l.c.; *Odontochilus longifolius* (Lindl.) Tang and Wang, Act. Phytotax. Sin. 1, 1:70, 1951.
Type: India, Sikkim, *Hooker* 335 (holo. K!, icon. K!, K–Lindl.).
Distribution: India (Sikkum).

Not found again since it was collected circa 1850, illustrated by J. D. Hooker (1894).

Rhomboda moulmeinensis **(Par. & Rchb.f.)** Ormd., ***comb. no.*** Basionym: *Hetaeria moulmeinensis* Par. & Rchb.f., Trans. Linn. Soc. Bot. 30:142, 1874 as *Etaeria* m.; Syn.: *Zeuxine moulmeinensis* (Par. & Rchb.f.) J. D. Hook., Fl. Brit. Ind. 6:109, 1890; *Odontochilus moulmeinensis* (Par. & Rchb.f.) Tang and Wang, Act. Phytotax. Sin. 1, 1:70, 1951; *Anoectochilus moulmeinensis* (Par. & Rchb.f.) Seidenf., Bot. Tidsskr. 66, 4:307, 1971.
Type: Burma, Moulmein, *Parish* 237 (holo. W (Herb. Reichenb. 26216mf), iso. K!).

Anoectochilus multiflorus **Rolfe ex Downie,** Kew Bull.:412, 1925.
Syn.: *Odontochilus multiflorus* (Rolfe ex Downie) Tang and Wang, Bull. Fan. Mem. Inst. Biol. 1:7, 1936.
Type: Thailand, Doi Sutep, *Kerr* 197 (holo. K!, iso. K!).
Distribution: China (Yunnan), Burma, Thailand.



Rhomboda wardii

A. Plant, to indicated scale. B. Flower. C. Column. D. Labellum hypochile inside. All from holotype. B., C. and D. not to scale, drawn freehand.

Material Examined: China – Yunnan, Sjimoo, 1,500m, *Henry* 12724 (K!); Burma – Moulmein, *Parish* 148 W (Herb. Reichenb. 26216mf); Moulmein, *Lobb* s.n. (K!).

Illustrated by J. D. Hooker (1894) and Seidenfaden (1971; 1978). Resembles *Hetaeria anomala* (lindl.) J. D. Hook. superficially (see Excluded Species), but that has inverted flowers.

Rhomboda wardii* Ormd., *sp. nov. Figure: page 326, A–D.
Species nova ad *R. fangjingensi* Ormd. arcte affinis sed foliis oblique oblongo-lanceolatis, floribus petalis late ovate-ellipticis breviter acuminatis et labello appendicibus adaxialibus rhombeis in ambitu differt. **Typus:** Burma – Hills east of the Mali Hka (river), 1,500m, 5–08–1937, *Kingdon Ward* 12889 (holo. BM!).

Reportedly epiphytic. **Rhizome** 7.5cm long x 0.6cm thick, creeping with fleshy villose roots at the nodes. **Stem** erect, 7cm long x 0.6cm thick, 3 leaved. **Leaves** thin, 13 nerved, obliquely oblong-lanceolate, acute, lamina 8–9cm long x 2.6–2.9cm broad, petiole 1.8cm long before dilating into the sheathing base. **Inflorescence** laxly shortly pubescent, with three sheathing bracts, the lowermost foliose, 20cm long x 0.2cm thick, peduncle 10.5cm long, the laxly 13 flowered rachis 9.5cm long. **Floral bracts** ovate-elliptic, shortly acuminate, laxly shortly pubescent, 7–10mm long x 3–4mm broad. **Pedicel** with **ovary** suberect, glabrous, cylindric, base and apex attenuate, 8–11mm long x 1.3mm broad. **Flowers** glabrous, resupinate at an angle, white. **Sepals** ovate-elliptic, shortly acuminate, 7mm long x 4–4.5mm broad, the laterals spreading widely. **Petals** basally strongly dilated, semicircular in lateral view, shortly subacuminate, the upper margin narrowly agglutinate to the dorsal sepal to form a galea, 7mm long x 4–4.5mm broad. **Labellum** 4 lobed, 7mm long x 6mm broad; hypochile 4mm long x 4–6mm broad, side lobes forward pointing when spread, broadly rounded, inflexed in natural position, internal basal appendages one each side, rhomboid, subacute, bicarinate callus laminate, oblong-elliptic, forward inclined, abruptly raising in apical ¾ of hypochile, external flange perpendicular to upper margin of hypochile, sunlunate, the free side basally directed; claw narrow, 1–1.5mm long; epichile bilobed, apiculate, lobes deflexed?, entire, obcuneate, apices rounded, 3mm long x 2mm broad. **Column** as per genus, strongly dilated from a narrow base, ca. 4mm long; wings very large, elliptic to semicircular, broadly rounded, each with a ¼ shorter apically free membrane on the outside.

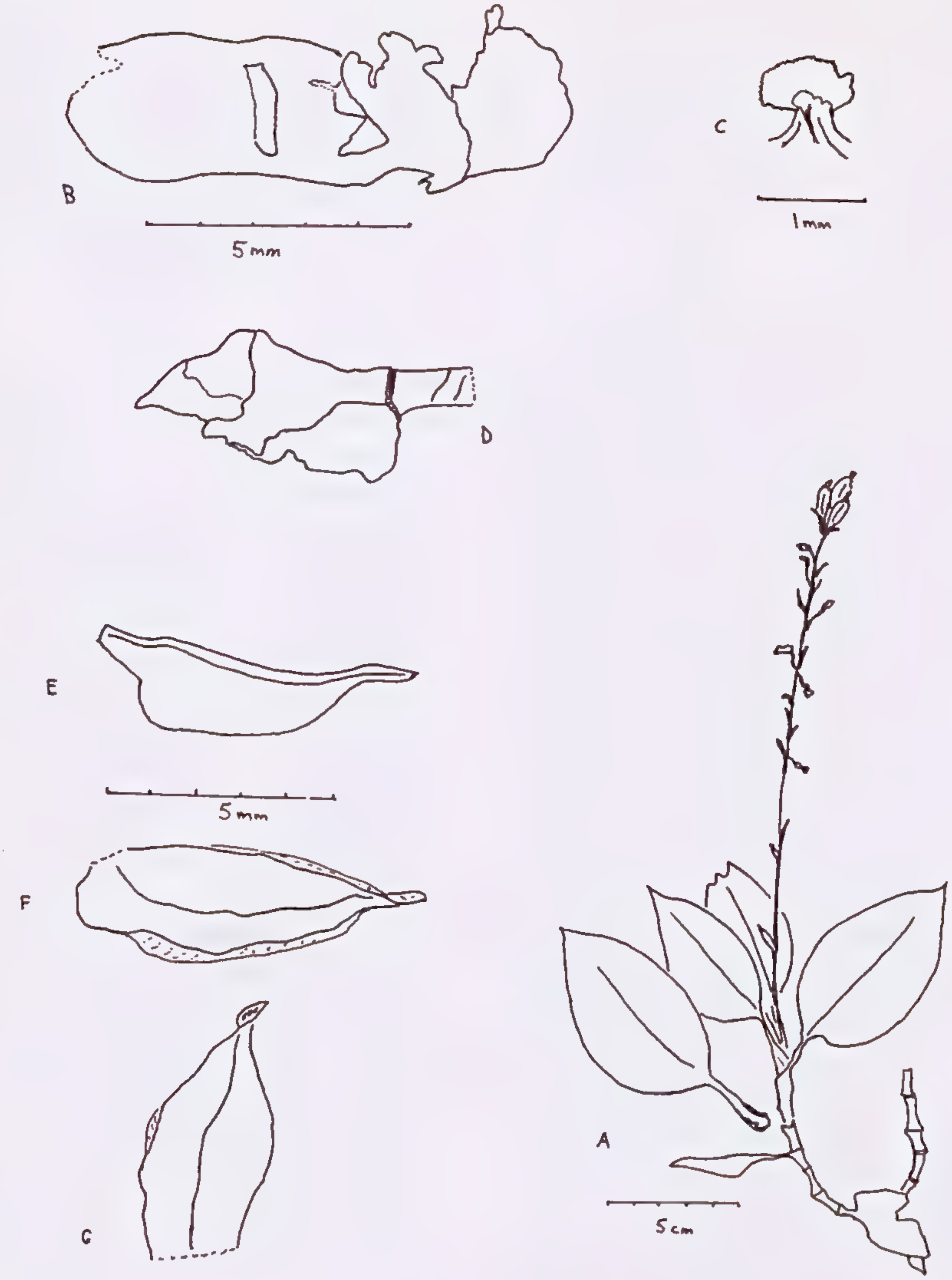
Etymology: Named after Frank Kingdon Ward, meritorious collector of Burmese plants who discovered this species.

Distribution: Burma.

I am indebted to Ms Caroline Whitfoord of the British Museum for bringing this plant to my attention. It is distinguished from the above two taxa in the entire, instead of erose lobes of the labellum epichile. From *R. fanjingensis* it differs in the narrower leaves, much broader petals and rhomboid instead of transversely elliptic internal basal appendages of the labellum.

Rhomboda fanjingensis* Ormd., *sp. nov. Figure: page 328, A–G.
Species nova ad *R. wardii* Ormd. arcte affinis sed foliis ovato-ellipticis, floribus petalis oblongis-lanceolatis et attenuato-acuminatis et labello appendicibus adaxialibus transverse ellipticis differt. **Typus:** China – north-east Guizhou, Mt. Fanjing, 450m, 11–1985, *Sino-British Plant Expedition* no. 0197 (holo. K!).

Rhizome broken off, remnant 4cm long x 0.6cm thick. **Stem** erect, decumbent in lower ⅓, 11.5cm long x 0.4–0.5cm thick, 6 leaved, the lower two somewhat withered. **Leaves** thinly subcoriaceous, 13 nerved, obliquely ovate-elliptic, acute, a white median line apparent, lamina 6.8–8.1cm long x 3–4.2cm broad, petiole 0.8–1cm long before dilating into the sheathing base. **Inflorescence** laxly shortly pubescent, with three sheathing bracts and 1–2 sterile? floral bracts, 20cm long x 0.2cm thick, peduncle 9.5cm long, the laxly 17 flowered rachis 10.5cm long. **Floral bracts** ovate-



Rhomboda fanjingensis

A. Plant. B. Labellum C. Internal basal appendage. D. Column. E. Petal. F. Lateral sepal. G. Dorsal sepal. To indicated scales from holotype.

lanceolate, acuminate, laxly shortly pubescent to 9mm long x 4mm broad. **Pedicel** with **ovary** erect, glabrous, 9mm long x 1–1.5mm thick. **Flowers** glabrous, resupinate at an angle, colour unknown but probably with pink-red sepals and white labellum and petals suffused in places with pink. **Dorsal sepal** narrowly ovate-elliptic, acuminate, 7mm long x 3.3mm broad. **Lateral sepals** reflexed?, obliquely ovate-oblong, acuminate, 7mm long x 2.5–3mm broad. **Petals** broadly clawed then dilated, narrowly ovate-oblong, long acuminate, the upper margin narrowly agglutinate to the dorsal sepal to form a galea, 7mm long x 2mm broad. **Labellum** 4 lobed, 7mm long x 5mm broad; hypochile 5mm long x 4.6mm broad, side lobes forward pointing when spread, broadly rounded, inflexed in natural position, internal basal appendages one each side, transversely elliptic, margin minutely denticulate, bicarinate callus laminate, elliptic, forward inclined, abruptly raising in apical ¾ of hypochile, external flange perpendicular to upper margin of hypochile, narrowly rectangular, free side basally directed; claw narrow, ca. 1mm long; epichile bilobed, apiculate, lobes erect?, entire?, subquadrate, apices rounded?, 2.3mm long x 1.8–2mm broad. **Column** as per genus, strongly dilated from a narrow base, 4–5mm long; wings large, broadest at the base, margin irregular.

Etymology: Named after the type locality, Mt Fanjing, a significant Buddhist holy mountain.

Distribution: China – Guizhou.

The type material is rather poor, the flowers in late anthesis with subsequent shrivelling, some having developed young fruits; they are also soaked in glue. The lobes of the epichile were crumpled up and torn, but I believe them to be rounded and entire. Consequently *R. wardii* seems to be its closest relative (see there for the distinctions). This is the last of the taxa with large epichile lobes.

Rhomboda abbreviata* (Lindl.) Ormd., *comb. nov. Figure: p330, A–C. Basionym: *Aetheria abbreviata* Lindl., Gen. & Sp. Orch. Pl.:491, 1840. Syn.: *Zeuxine abbreviata* (Lindl.) J. D. Hook., Fl. Brit. Ind. 6:109, 1890; *Hetaeria abbreviata* (Lindl.) J. J. Sm., Bull. Jard. Bot. Buitenz. s.3, 10:5, 1928 in obs.; *Odontochilus abbreviatus* (Lindl.) Tang and Wang, Act. Phytotax. Sin. 1, 1:70, 1951; *Hetaeria abbreviata* (Lindl.) Tang and Wang, Fl. Hainan. 4:205, 1977 comb. superfl.; *Anoectochilus abbreviatus* (Lindl.) Seidenf., Dansk Bot. Ark. 32, 2:41, 1978.

Type: Nepal – *Wallich* 7385 (holo. K–Lindl!).

Distribution: Nepal, Burma, Thailand.

Material Examined: Burma – sine loc., no label, **Lace** 5655 (K!). Thailand – Chantaburi, Soidao, 02–1959, Seidenfaden & Smitinand GT.3250 (C!).

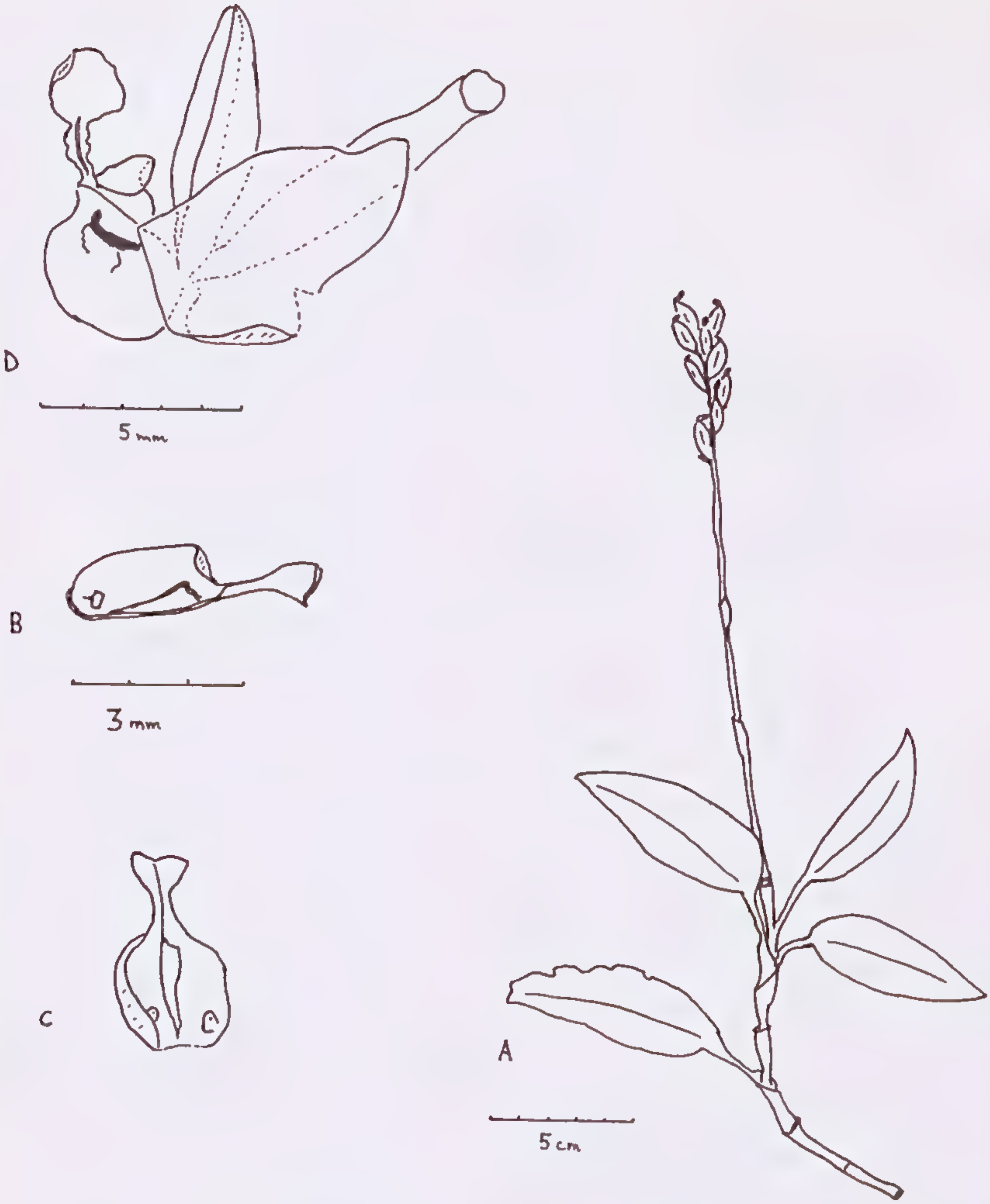
The type is in a rather poor condition, the Lace collection, probably from Burma, is in fruit but agrees very well with Lindley's floral sketches on the type sheet. Dr Seidenfaden kindly sent me his GT.3250, which is also in fruit and may be another species. Later authors have included *Dossinia lanceolata* Lindl., *Hetaeria cristata* Bl. var. *minor* Rendle and *Goodyera pogonorrhyncha* Hand.–Mazz. in the synonymy. None of these, however, match the type which is characterised by an obtriangular epichile, small internal basal appendages and a low-raising bicarinate callus.

Rhomboda lanceolata* (Lindl.) Ormd., *comb. nov. Basionym: *Dossinia lanceolata* Lindl., J. Linn. Soc. Bot. 1:186, 1857; Syn.: *Hetaeria lanceolata* (Lindl.) Rchb.f., Trans. Linn. Soc., Bot. 30:142, 1874 as *Etaeria* l.; *Anoectochilus pomrangianus* Seidenf., Dansk Bot. Ark. 32, 2:41, 1978.

Type: India – Khasia, Pomrang, 16-09-1850, *J. D. Hooker* and *T. Thomson* s.n. (holo. K!, icon. K!, K–Lindl!).

Zeuxine abbreviata auct. non (Lindl.) J. D. Hook.: J. D. Hook., Fl. Brit. Ind. 6:109, 1890; Ic. Pl. T.2178, 1894; King and Pantl., Ann. Roy. Bot. Gard. Cal. 8:287, T.358, 1898; J. J. Smith, Fedde Rep. 32:149, 1933; Blumea 5, 3:711, 1945 all pro parte, excluding basionym.

Distribution: Bhutan, India – Khasia, Malaysia, Sumatra.



Rhomboda abbreviata — A–C
Rhomboda confusa — D

A. Plant. B. Labellum with one hypochile side removed. C. Labellum after sketch by Lindley. ***Rhomboda confusa*** – D. Flower with a lateral sepal and column deleted. A. and B. to scale, from *Lace* 5655; C. not to scale, from the holotype *Wallich* 7385; D. From the holotype *Shinjo* s.n., to scale.

Material Examined: Bhutan – in the Dooars at Ambiok, ca. 1,500m, 09-1889, *Pantling* 346 (BM!, K!). Sumatra – Gunong Barus, 1,189m, 09-1975, colour slides by *Comber!*

This species, *Rhomboda bantaengensis* and *R. luzonensis* are characterised by the ovate-lanceolate epichile lobes. From the latter two it is distinguished by its ovate-lanceolate instead of ovate oblong-elliptic leaves. The epichile lobes are often observed as erect in dried material, but they are spreading with decurved tips in nature.

Rhomboda pogonorrhyncha **(Hand.–Mazz.) Ormd., *comb. nov.*** Basionym: *Goodyera pogonorrhyncha* Hand.–Mazz., Beih. Bot. Centralbl. 56 B, 3:472, fig., 1937.
Type: China – Kwangtung, Yiushan, *Mell* 728 (WU n.v.).
Syn.: *Hetaeria cristata* Bl. var. *minor* Rendle, Journ. bot. 11:310, 1902.
Type: China – Swatow, ca. 600m, 08 or 09-1899, *Dalziel* s.n. (holo. BM!). *Hetaeria cristata* auct. non Bl.: Hu, Gen. Orch. Hong Kong:49, 1977; Isaac-Williams, Intr. Orch. Asia:139, 1988; Yam and Weatherhead, Lindleyana 5, 3:199–203, 1990.
Distribution: China – Hong Kong south to Hainan.
Material Examined: China – Hong Kong, sketch by **Fung** (K!).

This species does not possess the robust stature of *Rhomboda cristata,* which also has larger, fleshier internal labellum appendages. It is distinguished from *R. abbreviata* by the subquadrate instead of obtriangular epichile. It needs to be critically compared with *R. yakusimensis*; I did not have sufficient material to do this.

Rhomboda yakusimensis **(Masamune) Ormd., *comb. nov.*** Basionym: *Zeuxine yakusimensis* Masamune, J. Soc. Trop. Agric. 3:393, 1931; Syn.: *Hetaeria yakusimensis* (Masamune) Masamune, Sci. Rep. Kanazawa Uni. 9:131, 1964; Masamune, J. Soc. Trop. Agric. 3:393, 1931 pro syn.; Masamune ex Ohwi, Fl. Jap.:370, 1953 nom. inval.
Type: Japan – Yakusima Island, 1-09-1931, *Masamune* 1436 (holo. TAI n.v.). *Hetaeria tokioi* Fukuyama, Bot. Mag. Tokyo 48:434, 1934; *Hetaeria cristata* Bl. var. *tokioi* (Fukuyama) Ying, Col. Illus. Pl. Taiwan 2:468, 1977.
Type: Taiwan – Taihoku Praef., near Urai, 09-1932, *Suzuki-Tokio* 4128 (holo. TI n.v.). *Hetaeria cristata* auct. non Bl.: Lin., Nat. Orch. Taiwan 1:204, 1975.
Distribution: Japan – Kyushu, Yakusima Island, Ryukyu Islands; Taiwan.
Material Examined: Japan – Kyushu, Ohsumi Prov., Kagoshima Prefecture, *Furuse* 11888 K(2)!.

The only material I have examined is fruiting. The species is fully described and illustrated in the Japanese literature (e.g. Maekawa 1971; Masamune 1990). It appears to differ from *Rhomboda cristata* in the same characters as given under *R. pogonorrhyncha.*

Rhomboda confusa **Ormd., *sp. nov. Figure page 330 D.***
Syn.: ? *Hetaeria cristata* auct. non Bl.: Garay and Sweet, Orch. South. Ryukyu Isl.:91, 1974. Species nova ab speciebus ceteris Rhombodae valde distincta labello epichilo obtuse cordato hypochilo ungue comparate angusto juncto.
Typus: Japan – southern Ryukyu Islands, Iriomote Island, upper stream of Nakama R., 26-08-1968, *Shinjo* s.n. (holo. K!).

Leaves ovate-elliptic, acute, petiolate 6–8cm long x 4–5cm broad. **Inflorescence** laxly many flowered, ca. 22cm long, peduncle 12cm long, rachis 10cm long. **Floral bracts** 8–10mm long. **Pedicel** with **ovary** erect, laxly pubescent, 9–10mm long. **Flowers** non-resupinate, colour unknown. **Dorsal sepal** narrowly ovate-oblong, obtuse, ca. 7mm long x 2.5–3mm broad. **Lateral sepals** ovate-elliptic, obtuse?, ca. 7mm long x 4mm broad. **Petals** narrowly clawed, ligulate, obtuse, the upper margin narrowly agglutinate to the dorsal sepal to form a galea, ca. 7mm long x 1mm broad. **Labellum** 3 lobed, ca. 6mm long x 3–4mm broad; hypochile ca. 4mm long x 3–4mm broad, side lobes forward pointing when spread, broadly rounded, inflexed in natural position, internal basal appendages one each side, claviform-falcate, obtuse, bicarinate callus low-raising in apical ¾ of hypochile, external flange irregularly parallel to upper margin of hypochile; claw narrow, ca. 1.5mm long x 0.5mm broad; epichile obtusely cordate, ca. 1.8mm long and broad. **Column** with subquadrate, rounded wings.

Etymology: From the Latin *confusus*, meaning confused, in reference to the probable reason why it has escaped description.

Distribution: Japan – southern Ryukyu Islands, Iriomote and possibly Okinawa.

The type consists of a single flower and a photograph of the specimen and is deposted in the herbarium of Cunio Nackejima. Consequently my examination of this species has been restricted and the above description will need supplementing. It is distinguished from all other *Rhomboda* species in the inverted flowers, ligulate petals and the narrowly clawed obtusely cordate epichile.

Rhomboda taiwaniana **(Ying) Ormd., *comb. nov.*** Basionym: *Hetaeria taiwaniana* Ying, Col. Illus. Pl. Taiwan 2:210, Pl.88, 1977.
Type: Taiwan – Nantou Hsien, Shou-chen-ta-shan, 16-07-1972, *Ying* 1203 (holo. NTUF n.v.).
Distribution: Taiwan.

This seems a close relative of *Rhomboda yakusimensis*; more knowledge is required of it.

Rhomboda luzonensis **(Ames) Ormd., *comb. nov.*** Basionym: *Adenostylis luzonensis* Ames. Orch. 2:57, fig. 1908. Syn.: *Zeuxine luzonensis* (Ames) Schltr., Engl. Bot. Jahrb. 45:394, 1911; Ames, Philipp. J. Sci. 2:314, 1907 nom. nud.: (Ames) Ames, Bot. Mus. Leafl. Harv. Uni. 6, 5:100, 1938 comb. superfl., *Anoectochilus luzonensis* (Ames) J. J. Wood, Kew. Bull. 41, 4:815, 1986.
Type: Philippines – Luzon, Lepanto District, Mt Data, 29-10-1905, *Merrill* 4604 (holo. AMES n.v., iso. K!).
Adenostylis vanoverberghii Ames, Philipp. J. Sci. 8, 6:408, 1913.
Type: Philippines – Luzon, Bontoc Subprov., *Vanoverbergh* 1490 (holo. AMES n.v., iso. BM(2)!, K!).
Distribution: Philippines – Luzon, Mindoro and Negros.
Material Examined: Philippines – Luzon, Bontoc Subprov., 1914, *Vanoverbergh* 3936 (NSW!); Benguet Prov., Mt Santo Tomas, 1904, *Williams* 1924 (K!); Lepanto Prov., Mt Data, *Ramos and Edano* 67 (K!); Mindoro, Mt Halcon, 11-1906, *Merrill* 5841 (K!); Negros, Negros Oriental Prov., Mt Talines, 1,200m, 02-03-1976, *Sands* 3233 (K!).

Sands 3233 is insufficient for a sure identification. This species is variable in most labellum details; *Rhomboda bantaengensis* (J. J. Sm.) Ormd. from Sulawesi may prove to be conspecific.

Rhomboda weberi **(Ames) Ormd., *comb. nov.*** Basionym: *Adenostylis weberi* Ames, Orch. 5:40, 1915; Syn.: *Zeuxine weberi* (Ames) Ames, Bot. Mus. Leafl. Harv. Uni. 6, 5:101, 1938.
Type: Philippines – Mindanao, Davao District, Mt Binatun, 02-11-1911, *Weber* 280 (holo. AMES(2) photocopy seen).
Distribution: Philippines – Mindanao.

Gustavo Romero (AMES) kindly sent me photocopies of this taxon.

Rhomboda angustifolia **(C. E. Carr) Ormd., *comb. nov.*** Basionym: *Hetaeria angustifolia* C. E. Carr, Gard. Bull. Str. Settl. 8:190,1935.
Type: Borneo – Sabah, Mt Kinabalu, main spur above Koung, ca. 760m, 11-1933, *C. E. Carr* 3770 (holo. SING n.v., iso. K!).
Distribution: Borneo – Sabah.
Material Examined: Borneo – Sabah, Mt Kinabalu, above Poring Hot Springs, 700–1,000m, 04-01-1984, *Beaman* 8233 (K!); Mt Kinabalu, east of Melangkap Kappa, 700–1,000m, 06-03-1984, *Beaman* 8779 (K!); Trus Madi formation, Lohan to Mamut Copper Mine, 1,000m, 09-07-1984, *Beaman* 10646 (K!); Sipitang District, Ulu Long Pa Sia, near Maga R., 1,275m, 23-10-1985, *J. J. Wood* 629 (K!).

So far the only Bornean *Rhomboda* species known, it is easily recognised by its narrow leaves. Critical comparison with *Hetaeria* *pauciflora* Ridl. (see Excluded Species) may show this is the earlier name.

Rhomboda cristata **(Bl.) Ormd., *comb. nov.*** Basionym: *Hetaeria cristata* Bl., Fl. Jav. Orch.:86, T.33, 1858; Syn.: *Dossinia cristata* (Bl.) Miq., Fl. Ind. Bat. 3:731, 1859; *Zeuxine cristata* (Bl.) Schltr., Fedde Rep., Beih. 1:77, 1911.
Types: Java – Gede, Tjiburrum and Gagarbintang, *Blume* s.n. (syn. L n.v., iso. BM!, K!).
Distribution: Java.
Material Examined: Java – sine loc., *Horsfield* s.n. (BM!); sine loc., cult. *Cjidobas Bot. Gard.*, slides by *Comber*!; Gunung Semeru, 1600, 11-06-1980, *Comber* 1180 (K!).

All reports of this species occurring outside Java have so far proved erroneous.

Rhomboda velutina **(J. J. Sm.) Ormd., *comb. nov.*** Basionym: *Hetaeria velutina* J. J. Sm., Bull. Jard. Bot. Buitenz. s.3, 9:33, T.3, fig.2, 1927.
Types: Java – Oengarang, Garoeng, 1,200m, 10-1910, *Docters van Leeuwen* s.n. (syn. L n.v.); Bali – Gunung Kelatakan, 435m, 07-1918, Maier Exped., *Sarip* 143 (syn. L n.v., iso. K!); Sumbawa – Gunung Tambara, 650m, 10-1920, *van Harreveld* s.n. (syn. L n.v.).
Distribution: Java, Bali, Sumbawa.

Most recently illustrated in Comber (1990).

Rhomboda bantaengensis **(J. J. Sm.) Ormd., *comb. nov.*** Basionym: *Hetaeria bantaengensis* J. J. Sm., Bull. Jard. Bot. Buitenz. s.3, 10:5, 1928.
Type: Sulawesi – G. Bantaeng, 1,800m, 20-06-1921, *Bunnemeijer* 12367 (holo. L n.v.).
Distribution: Sulawesi.

See comments under *Rhomboda luzonensis.*

Rhomboda minahassae **(Schltr.) Ormd., *comb. nov.*** Basionym: *Zeuxine minahassae* Schltr., Fedde Rep. 10:11, 1911; Fedde Rep., Beih. 74:T.8, no. 30, 1934.
Type: Sulawesi – Minahassa Pen., G. Mahawo, 1,200m, 11-1909, *Schlechter* 20510 (holo. B. – destroyed).
Distribution: Sulawesi.
Material Examined: Sulawesi – Minahassa Pen., Soputan Ra., Pantu Valley, 17-07-1954, *Alston* 16387 (BM!).

This species is closely related to *Rhomboda polygonoides* but is distinguished by having the epichile broader than the claw of the lip.

Rhomboda polygonoides **(F. Muell.) Ormd., *comb. nov.*** Basionym: *Goodyera Polygonoides* F. Muell., Fragn. 8:29, 1873; Syn.: *Orchiodes Polygonoides* (F. Muell.) Kze., Rev. Gen. Pl. 2:675, 1891; *Hetaeria polygonoides* (F. Muell.) Dockr., Austral. Pl. 3:350, 1966; *Zeuxine polygonoides* (F. Muell.) P. J. Cribb, in M. Clements, Austral. Orch. Res. 1:147, 1989.
Type: Australia – north-east Queensland, Mt Macallister near Rockingham Bay, 10-07-1865, *Dallachy* s.n. (holo. MEL!). ?*Zeuxine torricellensis* Schltr., in Schum. and Laut., Nachtr.:92, 1905; ?*Hetaeria torricellensis* (Schltr.) J. J. Sm., Fedde Rep. 11:554, 1913.
Type: New Guinea – Torricelli Ra., 1,000m, 04-1902, *Schlechter* 14435 (holo. B – destroyed). *Hetaeria falcatula* J. J. Sm., Bull. Dép. Agric. Ind. Néerl. 19:16, 1908: *Zeuxine falcatula* (J. J. Sm.) Schltr., Engl. Bot. Jahrb. 45:394, 1911.
Types: New Guinea – Noord R. near Geluks Hill, 150–200m, 08-1907, *Versteeg* 1596 (syn. BO n.v., iso. K!); Resirug, 600m, 08-1907, *Versteeg* 1632 (syn. BO n.v.). *Zeuxine dipera* Schltr., Fedde Rep., Beih. 1:83, 1911.
Types: New Guinea – Torricelli Ra., 600m, 11-1905 (prob. 09-1909), *Schlechter* 20055 (syn. B – destroyed; Kani Ra., 1,000m, 05-1908, *Schlechter* 17700 (syn. B – destroyed). *Zeuxine dipera* Schltr. var. *laxa* Schltr., Fedde Rep., Beih. 1:83, 1911.
Type: New Guinea – Ibo Ra., 1,000m, 05-1908, *Schlechter* 17811 (holo. B – destroyed, iso. E, K!, L, MO, NSW!). *Hetaeria gautierensis* J. J. Sm., Fedde Rep. 11:553, 1913.
Type: New Guinea – Gautier Ra., 500m, 11-1911, *Gjellerup* 841 (holo. BO n.v.).
Distribution: Indonesia – Japen Island and Irian Jaya; Papua New Guinea; Australia – north-east Queensland.

Material Examined: Papua New Guinea – Morobe Prov., Head of Baime Ck., New Yamap, 1,219m, 18-03-1970, *Streimann and Kairo* NGF 47631A (K! LAE!); Morobe Prov., Patep, 762m, *Millar* NGF 22510 (LAE!); Papua, Nepesip, 1,219m, *Cruttwell ex Native Coll.* s.n. (K!); Enga Prov., Paiela, Korombie, 1,600m, 12-11-1981, *Rees and Reeve* 378 (K!); West Sepik Prov., Torricelli Mts., Mt Sapua, 1,400m, 30-07-1981, *Reeve* 4024 (K!, NSW!); West Sepik Prov., Anguganak Bluff near Yangok Patrol Post, 350m, 13-08-1981, *Reeve* 4197 (K!); Southern Highlands Prov., south-east end of Lake Kutubu, Gesege, Mt Kasa, 900m, 17-11-1982, *Reeve* 5665 (K!, NSW!); Southern Highlands Prov., Tari District, Kangalu (Mananda), 1,550m, 04-07-1980, *Reeve* 2554 (K!); Australia – north-east Queensland, Pete's Ck. near Gordonvale, 20m, 07-1966, *Barry* s.n. (QRS!).

The following collections, all from Papua New Guinea, are rather insufficient for identification but may belong here: *Carr* 10157 (BM!); *Carr* 10276 (BM! K!, LAE!); *Reeve* 4955 (K!, NSW!); *Reeve* 5685 (K!); **Reeve** 6187 (K!). I have not been able to locate an isotype of *Zeuxine torricellensis*, and Schlechter's description and illustration of it is not accurate enough in details of the labellum epichile to disclose its true status. It is therefore questionably added to the synonymy.

J. J. Smith (1915) reduced his *Hertaeria gautierensis* into synonymy under *Hetaeria falcatula*; I find the latter must also be reduced to *Rhomboda polygonoides*. Similarly *Zeuxine dipera* and its var. *laxa* are not separable from the latter either.

The labellum epichile of *Rhomboda polygonoides* when fully spread out is oblong, while in the natural condition it appears ovate-cymbiform. In *R. atrorubens* and *R. novae-hiberniae* it is obcordate, these differences appearing consistent and demonstrating the very close relationship of these taxa. Records of *R. polygonoides* from the Solomon Archipelago refer to *R. dennisii* which is easily distinguished by its robust habit and transversely oblong-rectangular epichile.

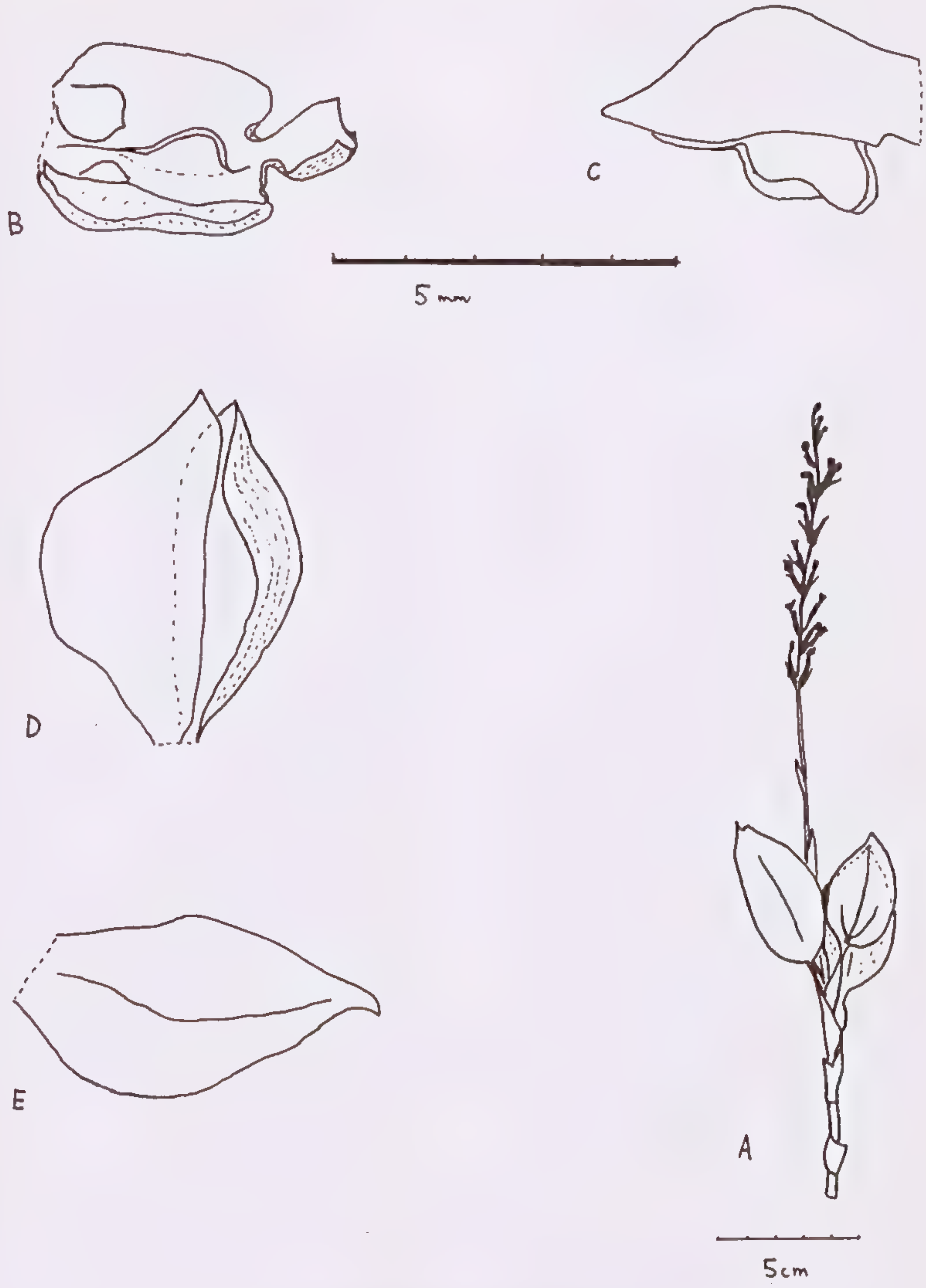
Rhomboda atrorubens **(Schltr.) Ormd., *comb. nov.*** Basionym: *Zeuxine atrorubens* Schltr., Fedde Rep., Beih. 1:81, 1911.
Type: New Guinea – Finisterre Ra., 1,000m, 07-1908, *Schlechter* 18053 (holo. B – destroyed, iso. E, K!, L, NSW!).
Syn.: ? *Zeuxine leucotaenia* Schltr., Engl. Bot. Jahrb. 58:57, 1922.
Type: New Guinea – Sepik area, 850m, 09-1912, *Ledermann* 8907A (holo. B – destroyed).
?*Zeuxine leucotaenia* Schltr. var. *floribunda* Schltr., Engl. Bot. Jahrb. 58:58, 1922.
Types: New Guinea – Sepik area, 1,100m, 09-1912, *Ledermann* 8843A (syn. B – destroyed; Sepik Area, 1,150m, 12-1912, *Ledermann* 10382D syn. B – destroyed).
Distribution: Papua New Guinea.
Material Examined: Papua New Guinea – Morobe Prov., Dengalu Village, 1,371m, *Millar* NGF 14461 (BRI!, K! LAE!); Morobe Prov., Bupu Village, cult. Lae Bot. Gard., *Dockrill* and *Coode* NGF 34175 (K! LAE!); Central District, south-east of Efogi Village, 1,500–1,600m, 07-09-1970, *Kanis* 1370 (K! LAE!); Milne Bay District, Kanasuru, 1,066m, 14-11-1955, *Cruttwell* 680 (K!).

I have added *Zeuxine leucotaenia* and its var. *floribunda* to the synonymy on the basis of the descriptions. The distinctions from *Rhomboda polygonoides* are given under that species. it is possible that *R. novae-hiberniae* will prove conspecific with *R. atrorubens*.

Rhomboda novae-hiberniae **(Schltr.) Ormd., *comb. nov.*** Basionym: *Zeuxine novae-hiberniae* Schltr., Fedde Rep., Beih. 1:82, 1911.
Type: New Ireland – near Punam, 600m, 07-1902, *Schlechter* 14695 (holo. B – destroyed, iso. BM!, BR, BRI!, K!, NSW!, P, W).
Distribution: Papua New Guinea – New Ireland.

This species is distinguished from *Rhomboda atrorubens* primarily by the crenate-irregular column wings. There have been no later Bismarck Archipelago collections to show if this character is stable or not.

Rhomboda alticola **(Schltr.) Ormd., *comb. nov.*** Basionym: *Zeuxine alticola* Schltr., Fedde Rep., Beih. 1:80, 1911.
Type: New Guinea – Bismarck Ra., 2,000m, 11-1908, *Schlechter* 18721 (holo. B –



Rhomboda alticola var. ***finisterrae***

A. Plant. B. Labellum C. Column. D. Petal and dorsal sepal. E. Lateral sepal. All from holotype to scale.

destroyed).

Syn.: *Zeuxine curvata* Schltr., Engl. Bot. Jahrb. 58:58, 1922.

Type: New Guinea – Schrader Ra., Sepik area, 2,070m, 06-1913, *Ledermann* 12198 (holo. B – destroyed). var. *alticola*. Labellum epichile transversely elliptic, apical corners rounded.

Distribution: Papua New Guinea.

Material Examined: Papua New Guinea – Morobe Prov., Bulldog Rd., 2,650m, 25-07-1977, *Fallen* 535 (LAE!); Morobe Prov., Bubu Valley, Balerau near Moimo, 2,300m, *Reeve* 5063 (K!, NSW!); Morobe Prov., Mt Kaindi, 15-09-1984, *Wallace* 867/84 (NSW!); Southern Highlands Prov., Tari District, Pamenda, 1,600m, 20-12-1982, *Reeve* 5916 (K!, NSW!); Eastern Highlands Prov., above Habi'ina Village, Mt Piora, 2,125m, 27-08-1975, *Sands* 1500 (K!); Eastern Highlands Prov., Kotuni, 10km north-east of Goroka, 1,820m, 18-06-1979, *Bellamy* 45 (LAE!); Western Highlands Prov., Jimmi Valley, 1,676m, 12-06-1955, *Womersley* and *Millar* NGF 7804 (LAE!); Western Highlands Prov., Mt Hagen, Jimmi R., 08-1954, *Meredith* 57 (LAE!); label lost ex LAE, *Meredith* s.n. (BRI!); West Sepik Prov., Star Mts., Mogofogda R., above junction with Bielga R. on Folongonon – Busilim track, 2,000m, 24-05-1975, *Vinas* and *Wiakabu* LAE 59599 (K! LAE!).

This species usually occurs at higher altitides than the other New Guinea *Rhomboda* species. It is easily recognised by its obliquely oblong-elliptic rather than ovate-lanceolate leaves and the transversely elliptic rather than oblong-obcordate labellum epichile.

Rhomboda alticola var. ***finisterrae*** **Ormd., *var. nov.*** Figure page 335 A–E. var. nov ab *R. alticola* var. *alticola* floribus labello epichilo ob-triangulari non transverse elliptico, et apice acuto non late obtuso differt,

Typus: New Guinea – Madang Prov., Saidor Subd., Sewe, 2,438m, *Sayers* NGF 19761 (holo. LAE!).

Rhizome creeping, 0.4cm thick, with fleshy villose roots at the nodes. **Stem** erect, 6–10cm long x 0.4cm thick, 3–5 leaved apically. **Leaves** thinly subcoriaceous, obliquely ovate-elliptic, shortly acuminate, dark green with a lighter median vein with purple petioles lamina 4–5.5cm long x 2.1–2.6cm broad, petiole 0.5–0.7cm long before dilating into the sheathing base. **Inflorescence** laxly shortly pubescent, with three sheathing bracts, 20cm long x 0.1–0.2cm thick, peduncle 10.5cm long, the laxly 22 flowered rachis 9.5cm long. **Floral bracts** ovate-lanceolate, acuminate, laxly shortly pubescent, 8–9mm long x 2–3mm broad, white. **Pedicel** with **ovary** erect, glabrous, 7–9mm long x 0.7–1mm thick. **Flowers** glabrous, opening skyward, resupinate at an angle, purple but probably with white petals and lip. **Dorsal sepal** ovate-elliptic, acute, 5mm long x 2.5mm broad. **Lateral sepals** spreading a little, obliquely ovate-elliptic, acute, 5.3mm long x 2.5mm broad. **Petals** broadly clawed then abruptly dilated, semi-elliptic when viewed laterally, acute, the upper margin narrowly agglutinate with the dorsal sepal to form a galea, 5mm long x 2.5mm broad. **Labellum** 3 lobed, 5mm long x 4mm broad; hypochile 3.3mm long x 4mm broad, side lobes forward pointing when spread, broadly rounded, inflexed in natural position, internal basal appendages one each side, fleshy, transversely elliptic, obtusely pointed, 1mm long x 1.2mm broad, bicarinate callus fleshy, semicircular, abruptly raising in apical half of hypochile, external flange running ± parallel to upper margin of hypochile; epichile shortly and broadly clawed, obtriangular with acute apices, apiculate, ca. 1.25mm long and broad. **Column** as per genus, gradually dilated from the base, 4.6mm long; wings subquadrate in front with rounded dilations distally.

Etymology: Named after the Finisterre Range where the type was collected.

Distribution: Papua New Guinea.

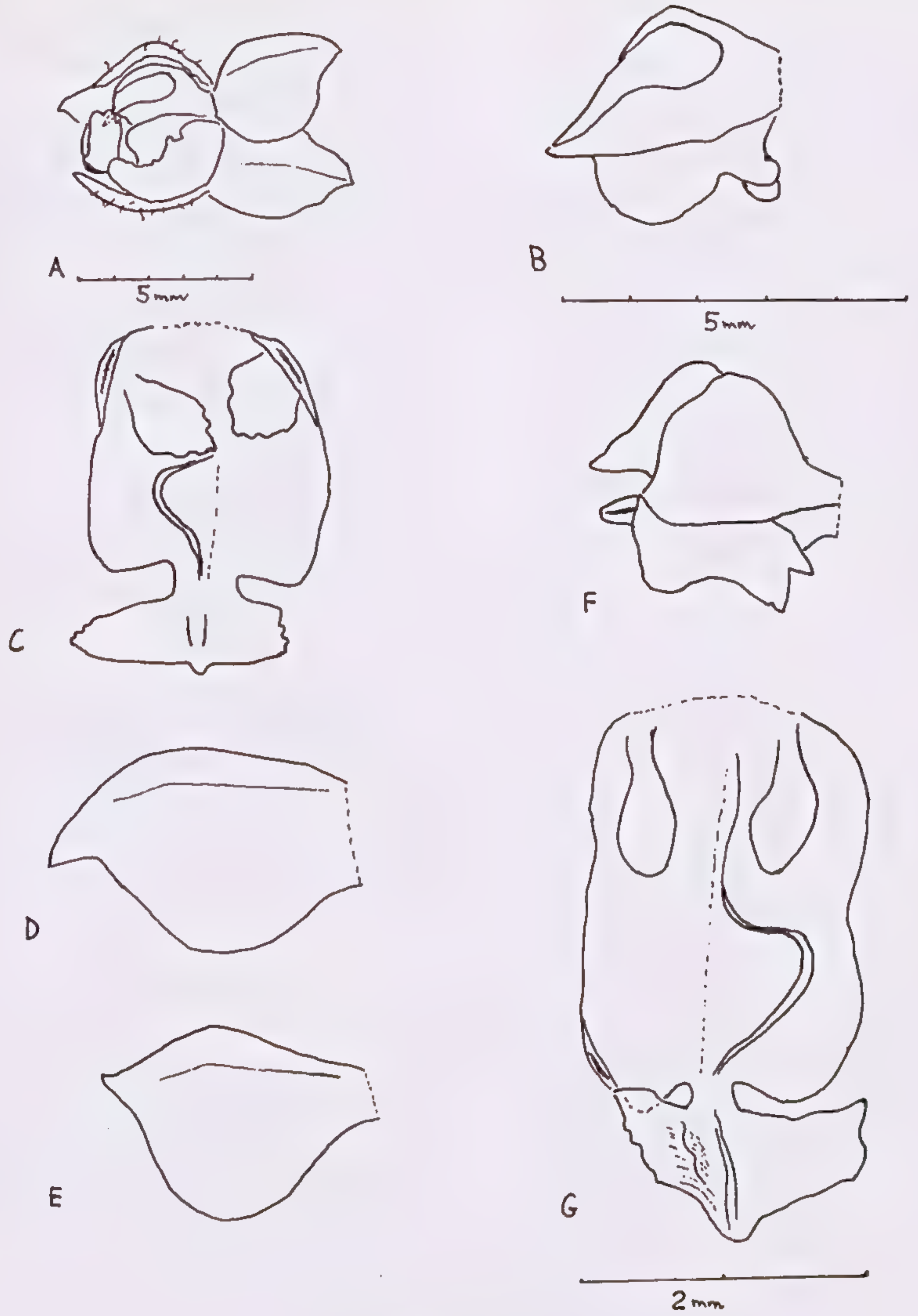
Although externally this new variety is identical to the typical plant, differences lie in features of the labellum which has a shorter clawed epichile with a truncate apex. Also, the internal basal appendages of the labellum seem relatively broader and almost sessile. *R. alticola* var. *alticola* has not yet been collected from the Finisterre Range.

Rhomboda dennisii **Ormd., *sp. nov.*** Figure page 337 A–G.

Syn.: *Zeuxine polygonoides* auct. non (F. Muell.) P. J. Cribb: Lewis and Cribb, Orch. Solomon Isl. and Bougainville:48, fig. 6 A–K, 1991.

Species nova ab speciebus ceteris Rhombodae Papuasiae floribus labello epichilo transverse oblongo-rectangulari non oblongo, obcordato, flabellato vel transverse elliptico differt.

Typus: Solomon Islands – San Cristobal, ridge east of Warahito, 548m, 01-08-1965, *Dennis* in RSS 2278 (holo. LAE!, iso. K!, NSW!).



Rhomboda dennisii

A. Flower. B. and F. Columns. C. and G. Labella. D. and E. Petals. A.–D. from *Schodde* and *Craven* 3829 (LAE). E.–G. From holotype, *Dennis* in RSS 2278 (LAE). B.–F. Are to same scale. A. and G. To their respective scales.

Rhizome creeping, 0.4–0.8cm thick, with fleshy villose roots at the nodes. **Stem** erect, 30–50cm long x 0.4–0.7cm thick, 2–7 leaved apically. **Leaves** thinly subcoriaceous, obliquely ovate-lanceolate to elliptic, acuminate, light to dark glossy green ± with a lighter to white-silver coloured mid vein, lamina 6–12.4cm long x 1.5–4cm broad, petiole 1.2–3.6cm long before dilating into the sheathing base. **Inflorescence** laxly short pubescent, pale green with 2–3 sheathing bracts, 15–30cm long x 0.07–0.2cm thick, peduncle 8–14cm long, the laxly 12–23 flowered rachis 6–16cm long. **Floral bracts** ovate-lanceolate, acuminate, laxly short pubescent, 6–9mm long x 2–3mm broad, pink. **Pedicel** with **ovary** sparsely laxly pubescent, patent to erect, 4–12mm long x 0.7–1.7mm thick, pale green. **Flowers** with sparsely laxly pubescent sepals, resupinate at an angle, sepals buff to green, variously pink tinged, petals white, labellum white with some yellow-orange at the base, column yellow. **Dorsal sepal** ovate-elliptic, subacute, 4–6mm long x 2.5–3.5mm broad. **Lateral sepals** not to widely spreading, slightly oblique, ovate-elliptic, subacute, 4–6mm long x 3–4mm broad. **Petals** shortly and broadly clawed, then abruptly dilated, semi-circular when viewed laterally, subacute, the upper margin narrowly agglutinate with the dorsal sepal to form a galea, 4–6mm long x 2.5–3mm broad. **Labellum** 4 lobed, 4–5mm long x 2.5–3.3mm broad; hypochile 3–3.6mm long x 2.5–3.3mm broad, side lobes ± truncate, slightly forward pointing when spread, rounded, inflexed in natural position, internal basal appendages one each side, fleshy, margin entire to irregular, oblong-elliptic to broadly rhombic, 1–1.4mm long x 0.4–1mm broad, bicarinate callus fleshy, semi-circular, abruptly raising in apical half of hypochile, external flange fleshy, irregularly running along the length of the hypochile; claw very short and broad, to 0.4mm long; epichile ± transversely oblong-rectangular, apiculate, 1–1.4mm long x 2–3.3mm broad, the lobules slightly broader at the base with rounded to irregularly truncate apices, thinly fleshy to very membranous. **Column** as per genus, abruptly dilated from the base, 3.4–3.6mm long; wings large, the proximal part quadrate-rounded, the distal part very variable, obtusely lobulate to acutely bidentate.

Etymology: Named after Geoffrey Dennis, meritorious collector of Solomon Island plants who gathered the type material.

Distribution: Papua New Guinea – Bougainville; Solomon Islands – Choiseul, Gaudalcanal, Kolombagara, Makira (=San Cristobal), New Georgia, Ranongga and Rendova.

Material Examined: Papua New Guinea – Bougainville, Lake Loloru Crater, Middle Siribai Gorge, 609m, *Schodde & Craven* 3829 (BRI!, K!, LAE!); Lake Loloru Crater, 792m, 03-08-1964, *Craven & Schodde* 174 (LAE!); Solomon Islands – Choiseul, Mt Maetambae, 750m, 29-10-1986, *Mitchell* 43 (K!); Gaudalcanal, Mt Gallego, 500m, 21-10-1984, *Cribb, Dennis & Campbell* 5023 (K!); –, Vuanimaho R., 720m, 16-05-1987, *Wickison* 142 (K!); Kolombangara, above Vanga Mission Station, 1,200m, 1985, *Chaplin* 834 (K!); –, loc. cit., 1,000m, *Chaplin* 824 (K!); –, track from Vanga to summit, 500m, 3-11-1984, *Cribb & Campbell* 5131 (K!); –, river valley, 762m, *Hunt* in RSS 2506 (K!); New Georgia, Loggina Hill above Borora, 650–740m, *Wickison* 43 (K!); Ranongga, Mt Kela, 500m, 12-11-1986, *Mitchell* 66 (K!); Rendova, Ughele, 700m, 01-06-1986, *Dickson* 38 (K!).

This species may be distinguished from its Papuasian counterparts by its tall, robust habit and the transversely oblong-rectangular labellum epichile. There is some variability in leaf shape, in the lobules of the labellum epichile and the posterior part of the column wings. Craven and Schodde 174 was cited under *Goodyera erythrodoides* Schltr. by Lewis and Cribb (1991), but belongs here.

EXCLUDED AND INSUFFICIENTLY KNOWN SPECIES

I have gathered below species that have been wrongly assigned to *Rhomboda* or its synonyms. *Hetaeria anomala* is added because of its superficial resemblance to *Rhomboda moulmeinensis. Hetaeria maritima* J. J. Sm., *Zeuxine andamanica* King and Pantl. and *Z. rolfeana* King and Pantl. were all originally compared to species here placed in *Rhomboda.* However, they appear correctly placed in their respective genera. One species, *Hetaeria pauciflora* is insufficiently known to me.

***Hetaeria anomala* (Lindl.) J. D. Hook.,** Fl. Brit. Ind. 6:116, 1890. Basionym: *Aetheria anomala* Lindl., J. Linn. Soc. 1:185, 1857.
Type: India – Assam, *Griffith* s.n. (holo. K-Lindl.!).

The synonyms of this previously obscure name include *Zeuxine biloba* Ridl., *Hetaeria grandiflora* Ridl., *H. rotundiloba* J. J. Sm. and *H. hainanensis* Tang and Wang. Illustrations of it may be found under the various synonyms in Seidenfaden (1978), Seidenfaden and Wood (1992) and Wood, Beaman and Beaman (1993). The comparatively large flowers and prominent lobules of the labellum epichile are rare features in *Hetaeria* and thus this species greatly resembles *Rhomboda moulmeinensis* and its relatives. However, *Hetaeria anomala* has inverted, strigosely hairy flowers, a shallow labellum hypochile which lacks an external flange and the medial bicarinate callus, there are two internal basal appendages each side (instead of one) and the column lacks wings.

***Hetaeria lamellata* Bl.,** FL. Jav. Orch.:89, T.35, fig. 1, 1858.
Syn.: *Rhomboda lamellata* (:Bl.) Miq., Fl. Ind. Bat. 3:747, 1859.
Type: Java, *Blume* s.n. (holo. L n.v.).

This is a true *Hetaeria,* which apart from its inverted flowers (found once in *Rhomboda*), may be distinguished from *Rhomboda* by its labellum hypochile which lacks an external flange and the medial bicarinate callus. There are also two internal basal appendages each side and the column lacks wings.

***Hetaeria linguella* (C. E. Carr) J. J. Wood and Ormd.,** Orch. Rev. 102, 1198:216, 1994.
Basionym: *Zeuxine linguella* C. E. Carr, in Gard, Bull. Straits Settl. 8:71, 1935.
Type: Borneo – Sarawak, *Synge* S.302 (holo. SING. n.v., iso. K!).

Carr placed this in *Zeuxine* Section *Hetaeriopsis,* a synonym of *Rhomboda*. Indeed, in floral structure this species is quite reminiscent of the latter because the labellum hypochile is subquadrate and possesses a median keel, the column is also narrowly winged. However, the labellum hypochile lacks an external flange, the median keel is not apically raised, the internal basal appendages are 3 lobed (always entire in *Rhomboda*) and the column has a prominent elongate rostellum (short and broad in *Rhomboda*).

***Hetaeria pauciflora* Ridl.,** J. Fed. Mal. St. Mus. 4:73, 1909.
Type: Malaya, *Ridley* s.n. (holo. SING. n.v., icon. K!).

I found one of Ridley's rough sketches at Kew, also Seidenfaden and Wood (1992); have provided a sketch after the type specimen. Based on the available descriptions and drawings I believe this is a *Rhomboda* species which is externally much like *R. angustifolia* from Borneo. I have abstained from a formal transfer until I can examine the holotype to confirm vital characters of the labellum hypochile.

ACKNOWLEDGEMENTS

Aside from those persons already mentioned throughout the text, I wish to thank Jim Comber for providing slides of some species, Jeff Wood for providing literature and reading through the manuscript, the Directors, herbarium and library staff of the following institutions: BM, BRI, K, LAE, MEL, NSW and QRS. All help was greatly appreciated and any person not mentioned is through oversight and not intended. Rod Henderson (BRI) kindly provided the Latin diagnoses.

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✾

IRA BUTLER TROPHY COMMITTEE

Ruth Rudkin
18 Lyle Avenue, Lindfield, N.S.W. 2070

THE 1994 GRAND CHAMPION AUSTRALIAN NATIVE ORCHID HYBRID

The winner of THE GOLD IRA BUTLER TROPHY is Joe O'Neil with *Dendrobium* X*gracillimum* 'Joan Allison' AM/VOC (Plates 35 and 36)

The photographic slides provided showed a large plant, with very many well flowered racemes. The shape of the flowers was shown to be excellent, both in front and side view and the texture appeared to be firm. The colour was a strikingly vibrant yellow and not a mark or imperfection to be seen. The average size of the flowers as given on the nomination form was, horizontally 28mm and vertically 32mm, a very good size for that hybrid.

The nomination of this *D.* X*gracillimum* came from the Victorian Orchid Club. It had been the Champion Native Orchid Hybrid and the Champion Orchid of their Town and Country Show, Melbourne and had been awarded an AM. All this information was given to the Ira Butler judges only after their judging was completed.

There were 30 plants nominated, seven of which had won awards. There was also a previous Gold Ira Butler Trophy winner so this plant had stiff competition. The judging list supplied to the judges contained no clonal names, awards received, names of shows, or state of origin so that all plants could be treated equally and without bias.

Silver Ira Butler Trophies have been won by the following:–

1. 13th Australian Orchid Conference and Show, Darwin, Champion Australian Native Orchid Hybrid, awarded HCC by the AOC and Grand Champion Gawler Winter Show — *Dendrobium* Graham Hewitt 'Dee Pee' HCC/AOC, D. and P. Harmer.
2. State Orchid Societies for plants which have been Champion Australian Native Hybrid of their shows:–
   O.S.N.S.W. – Winter Show, Roselands – *D.* Rosella 'Red Giant', Mike Harrison.
   – Spring in the Gardens – *Sarcochilus* Fitzhart 'Sweetie', Barrita Orchids.
   O.C.S.A. – Autumn Show – *Dendrobium* Pauline Rankin X *D. bigibbum*, I. McDonald owner and hybridist.
   – Winter Show – *D.* Peter, Roger Harraman.
   – Spring Show – *D.* Zip 'Pirie', Bruce Mules.
   O.S.W.A. – Winter Show – *D.* Red River, Rod Bitton.
   – Spring Show – *D.* Wonga, John Sullivan.
   Tas.O.S. – Spring Show – *D.* Aussie Zest 'Jean', J. F. and B. M. Smith.
3. Grand Champion of a State Affiliated Society:–
   Devonport Orchid Society – Spring Show – *Sarcochilus* Melba 'Gawler', John Cannon. Hybridist: Ken Russell.
   Woolgoolga and D.O.S. – Winter Show – *Dendrobium* Hilda Poxon 'Carlingford' AM/NSW/AOC, N. & K. Mitchell. Hybridist: Sid Batchelor.
4. Native Orchid Champion of a A.N.O.S. Council or Group or Native Orchid Society Show:–
   A.N.O.S. Council – Ken Russell's Open Day and Show – *D.* Hilda Poxon 'Sid', Henry Wilson. Hybridist: Sid Batchelor.
   Central Coast – Spring Show – *D.* Nunkimbil X *D. falcorostrum*, Craig Alexander.
   Far North Coast – A.N.O.S. Show, Ballina Fair – *D.* Elegant Heart, H. G. Young. Hybridist: Laurie Jarvis.
   Geelong – Spring Show – *Sarcochilus* Canary X *Rhinochilus* Dorothy, Lorraine Fagg. Hybridist: Ken Russell.
   Macarthur & D.O. Group – Spring Show – *Dendrobium* X*delicatum* 'Show Pink', W. J. Kennewell.
   Newcastle – *Sarcanthinae* Show – *Sarcochilus* Fitzhart 'Marie', Marie Ann Simpson.
   N.O.S.S.A. – Spring Show – *Dendrobium* Emma 'Roslyn', Bruce Mules. Hybridist: Phil Spence.
   Pt. Hacking – Spring Show – *D.* Karloo 'G.C.', N. Roper. Hybridist: Col Brandon.
   – *Sarcanthinae* Show – *Sarcochilus* Melba 'Coraltone', Kevin Wilson.
   Sydney – Spring Show – *Dendrobium* Yondi Sparkle 'Elizabeth', Alan Ferrie. Hybridist: Sid Batchelor.
   – *Sarcanthinae* Show – *Sarcochilus* Jewell 'Dungog' HCC/AD/ANOS, Sid Batchelor. Hybridist: Ken Russell.
   Warringah – Spring Show – *Dendrobium* Yondi Gold, D. Butler. Hybridist: Sid Batchelor.
   Wollongong & D.N.O.S. – Autumn Show – *Parachilus* Sweetie, Tom Gray. Hybridist: Wal Upton.
   – Spring Show – *Dendrobium* Star of Riverdene, Bruce Porter.
   – *Sarcanthinae* Show – *Cymbidium* Little Black Sambo, John Hinds.

The following awarded plants were nominated but were not show champions and therefore do not get a Silver Trophy.

A.N.O.S. Council – *Dendrobium Xleeanum* HCC/ANOS, Mike Harrison.
Queensland O.S. – *D.* Chrystaline 'Kenwyn' HCC/QOS, W. G. Walters.
O.S.N.S.W. – *D.* Karsun 'S.S.O.F.T.Y.' HCC/NSW, N. Roper. Hybridist: Col Brandon.

Congratulations are in order to all societies, groups, growers and hybridists for a really good year of orchid growing and showing. Special secretary's commendation to Max Clow, Registrar of the O.S.W.A. in particular and to all those other Registrars or Show Marshalls who filled in every question on the nomination form, typed or wrote clearly and sent three good slides.

From the Ira Butler Trophy Committee, looking forward to an even better year in 1995.

IRA BUTLER TROPHY WINNERS — 1994

Plate 36: *Dendrobium Xgracillimum* 'Joan Allison' AM/VOC.
Photo: J. O'Neil.

▲

◀ **GRAND CHAMPION AUSTRALIAN NATIVE HYBRID**

Plate 35: *Dendrobium Xgracillimum* 'Joan Allison' AM/VOC. Photo: J. O'Neil.

CHAMPION AUSTRALIAN NATIVE SPECIES

▼ ▼

Plate 37: *Peristeranthus hillii.*
Photo: D. Titmuss.

Plate 38: *Peristeranthus hillii.* Photo: D. Titmuss.

IRA BUTLER TROPHY COMMITTEE

Ruth Rudkin
18 Lyle Avenue, Lindfield, N.S.W. 2070

CHAMPION AUSTRALIAN NATIVE ORCHID SPECIES OF THE YEAR 1994

The winner of THE BILL MURDOCH TROPHY is Erik Leilkajis with *Peristeranthus hillii* (Plates 37 and 38)

A particularly well cultured plant with nine racemes of up to 230mm in length. There were about 64 unblemished flowers, pale brown in the centre and darker brown at the apex of the segments. This plant was an eye catcher at the A.N.O.S. Warringah Group's Spring Show and was judged Champion Australian Native Orchid Species. The three photographic slides and the information supplied with the nomination form did it ample justice.

For this trophy there were 23 nominations from all parts of Australia except Queensland and the Northern Territory. There were some excellent entries, with three slides well photographed, in focus, neither over or underexposed, with good backgrounds and no embellishments. The list of plants given to the judges showed no clonal names or awards, names of shows or state of origin. Judging was solely from the slides and information about the plant supplied on the form.

There is only one Bill Murdoch Trophy given each year. The following is a list of plants that were nominated from State Orchid Societies, Champion Native Species:–

O.S.N.S.W. – Spring in the Gardens – *Dendrobium speciosum* 'Charlie' AM/NSW, D. Butler.
– Winter Show – *Liparis condylobulbon*, E. Leilkajis.
– Award of AM – *Dendrobium speciosum* var. *speciosum* 'John Lynch' AM/NSW, B. Fletcher.
O.C.S.A. – Autumn Show – *Pterostylis abrupta*, Nesbitts Orchids.
– Winter Show – *P. taurus*, Nesbitts Orchids.
– Spring Show – *Dendrobium teretifolium*, W. and A. Green.
O.S.W.A. – Winter Show – *D. teretifolium*, H. Lodge.
– Spring Show – *D. aemulum*, R. Bitton.
– Award HCC – *Pterostylus recurva* 'Muriel Colyer' HCC/WA/AOC, C. A. (Mick) May.
V.O.C. – Town and Country Show, Melbourne – Also awarded HCC – *Dendrobium kingianum* 'Highclere' HCC/VOC, G. Garrett.
Tas.O.S. – Spring Show – *D. kingianum*, M. Mitchell.

State affiliated society, Grand Champion of Show:–

Central Coast and Lakes O.S. – Spring Show and Award of HCC – *D. linguiforme* var. *nugentii* 'Jeffrey' HCC/NSW, F. and B. Fear.

A.N.O.S. groups and native orchid societies, Champion Native Species:–

Geelong – Spring Show – *Sarcochilus hartmannii*, K. Cummins. Line bred by J. Wolfe.
Macarthur & D.O. Group – Spring Show – *Dendrobium kingianum* 'Russell's Red' X 'Inferno', N. Biffen. Bred by S. Batchelor.
N.O.S.S.A. – Spring Show – *Caladenia sp.*, L. and W. McHugh.
Pt. Hacking – Spring Show – *Dendrobium speciosum* 'National White' x Self, shown and bred by C. Brandon.
– *Sarcanthinae* Show – *Sarcochilus hartmannii* ('Red Snow' X BK No. 1), N. Roper. Bred by K. Russell.
Sydney – Spring Show – *Phalaenopsis rosenstromii* (*P. amabilis* var. *papuana*), shown and bred by M. Harrison.
– *Sarcanthinae* Show – *Sarcochilus hartmannii* 'Highlight' HCC/NSW/ANOS (Plate 41), R. and S. Nelson. Bred by Tinonee Orchids.
Warringah – Spring Show – *Peristeranthus hillii*, E. Leilkajis.
Wollongong & D.N.O.S. – Autumn Show – *Cadetia taylori*, M. Harrison.
– Spring Show – *Dendrobium kingianum*, Bruce Porter.
– *Sarcanthinae* Show – *Dendrobium monophyllum*, R. Wheeldon.

As can be seen from the above, of the 23 plants nominated, six of them had gained an award and six were line bred. Of the 13 plants from N.S.W., 11 were from A.N.O.S. or Native Orchid Societies. The Committee congratulates everyone for the high standard of the plants submitted and is looking for even greater competition from species enthusiasts next year.

No. 16: *Dendrobium tetragonum* A. Cunn.

Common Name:	Tree spider orchid
Subfamily:	Epidendroideae
Tribe:	Epidendreae
Subtribe:	Dendrobiinae
Genus:	*Dendrobium* Swartz

Distribution: *Dendrobium* is a widespread genus, with species found from India and Sri Lanka south to Australia and New Zealand. *D. tetragonum* is found from south-east NSW to north-east Queensland. The type variety is found from south-east NSW to south east Queensland; *D. tetragonum* var. *giganteum* is found in north-east Queensland.

Notes: The genus *Dendrobium* is one of the largest genera in the Orchidaceae and is estimated to contain between 900 and 1,400 species. *D. tetragonum* is a distinctive species, which grows as an epiphyte or lithophyte. A number of varieties have been described, based on the size and coloration of the flowers and the number of flowers on the raceme. These varieties were recently described as species. The pseudobulbs are pendulous or semi-pendulous with constricted basal sections which are thin and wiry and progressively expand into the apical section. The specific name for the plant is derived from the shape of the apical section of the pseudobulbs which have four sides which are separated by acute ridges. Each pseudobulb has between two and five apical leaves. The raceme is short and contains up to nine widely opening starry flowers. The sepals and lateral petals are long and thin and taper from the base to a narrow tip. The size of the flowers varies from the smaller flowers with a diameter of 3cm, to the larger flowers where sepals and petals can be up to 12cm long. Despite the low flower number for some of the plants, the shape and size of the flowers have ensured that this species has been used a number of times in hybridising.

Pollination: There is no recorded pollinator for this species.

Conservation Status: This species is not considered to be currently under threat, although may be threatened in the future due to urbanisation and horticultural collecting.

Culture: Due to its pendulous habit, *D. tetragonum* is well suited to cultivation on mounts. These plants are able to be grown in a bush house or glasshouse with moderate light and ample humidity. Success has been achieved by growing plants over a pool of water to increase the ambient humidity.

Illustration: Painting: Illustrated is a plant of *D. tetragonum* which shows the semi-pendulous habit of the pseudobulbs with the short inflorescences of spidery flowers.

Description: Tony Slater, 17 Dudley Street, Mitcham, Victoria 3132.

Illustration: Helene Wild, 56 Civic Parade, Seaholme, Victoria 3018.

Line Drawings and Captions: Walter T. Upton, P.O. Box 215, West Gosford, NSW 2250.

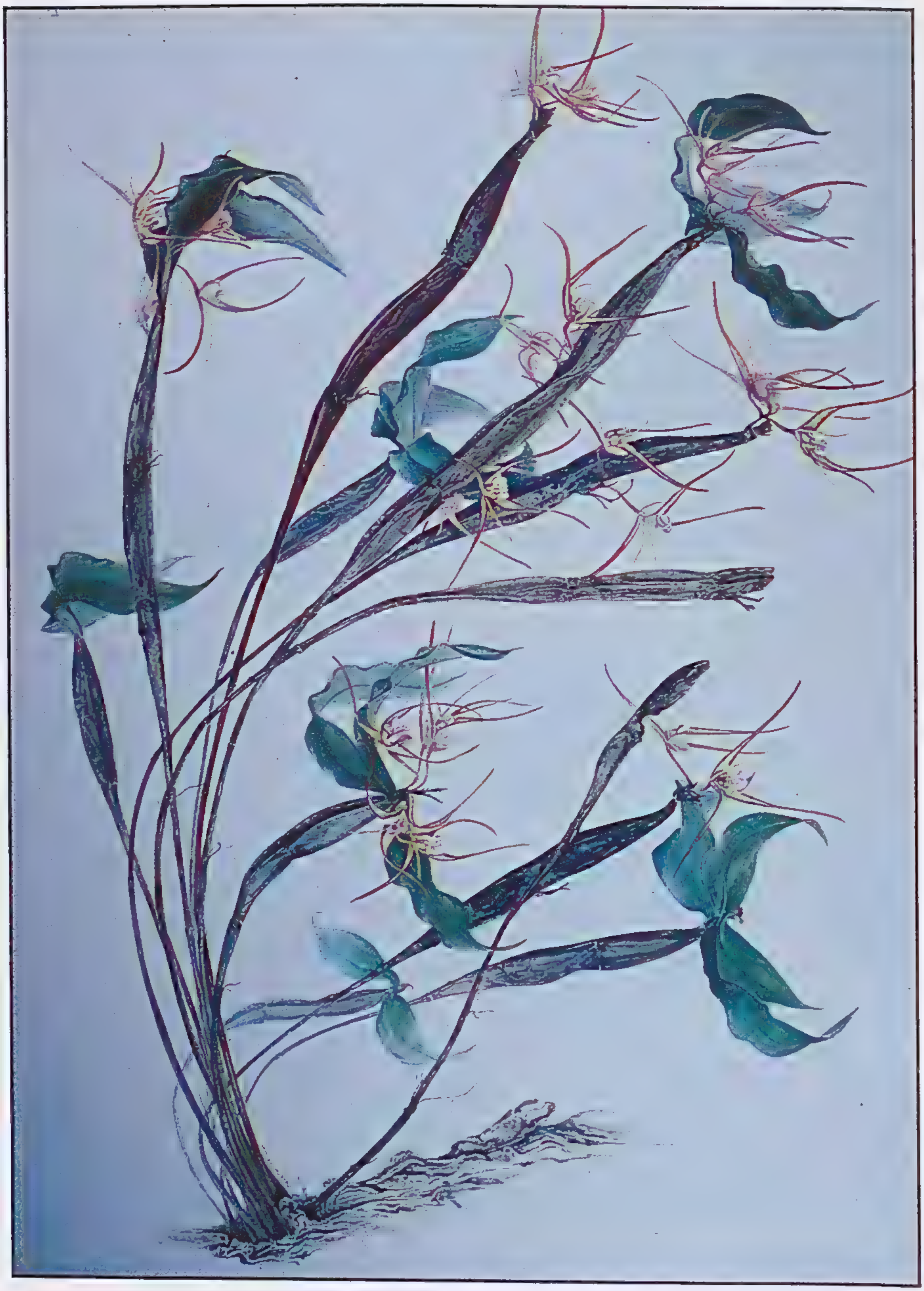
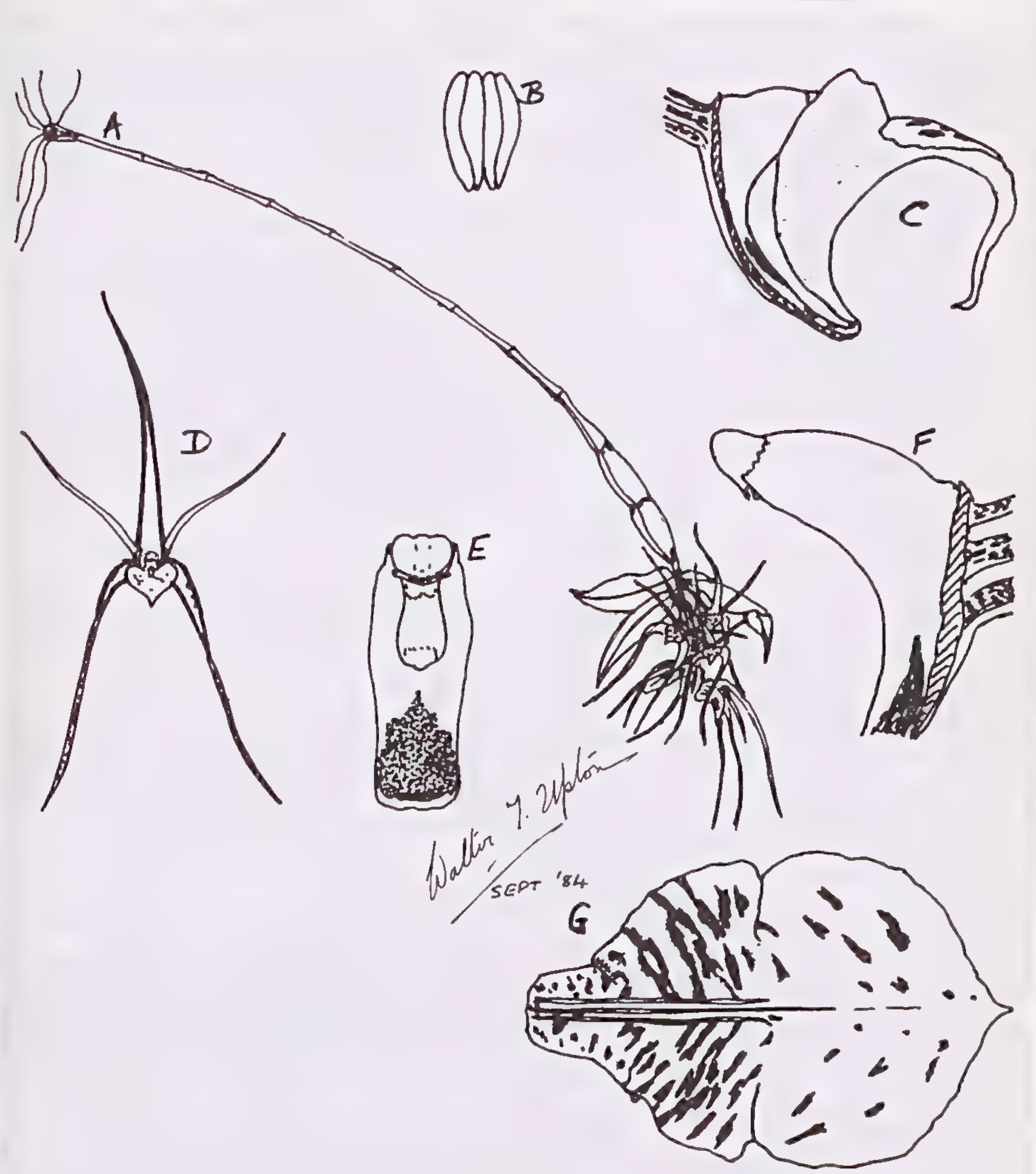


Plate 39: *Dendrobium tetragonum A. Cunn.*
From a painting by Helene Wild.



Dendrobium tetragonum A. Cunn.

A form from the lower north coast area of New South Wales, Australia.

A. Plant	1/5thX	E. Column, front view	4X
B. Pollinia	16X	F. Column, side wide	8X
C. Column & labellum, side view	4X	G. Labellum pressed flat	4X
D. Flower, front view	⅔rdX		

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LETTER TO THE EDITOR

J. T. Woolf
P.O. Box 7011,
Toowoomba, Qld. 4352
20th December, 1994

The Editor,
The Orchadian

Dear Sir,

I read, with interest, the article in the December issue of *The Orchadian* Vol. 11 No. 6 on the red flecked *Dendrobium speciosum* by Neil and Meg Finch.

I found this article very disturbing as no scientific data was used to back up the claim that these plants were "suspected of carrying a virus". In reading the article I could not find any reason for plants being suspect in that these markings could also possibly be caused by any of the following:–

1. Poor culture, lack of fertiliser, sour compost may be the reason for lack of spots some years.
2. Genetic mix-up, creating enhancement of colour normally hidden.
3. Peloric freaks of nature as is seen in many other genera.
4. Over spray of weedicides, etc. (may result in one off colour markings).
5. Climatic conditions that differ from year to year.
6. Fertiliser, the use of the right chemical can vastly enhance colour.

The other factor is that orchid viruses unique shapes can be easily recognised in most cases by virus researchers, using electron microscopy, however, several samples may be needed at different stages of growth and with the more fragile viruses the sampling and testing must be carried out very quickly.

We were fortunate to be given several superb clones of the spotted speciosums and, as with our other stud plants, samples were sent for testing in 1992, along with samples of seedlings where the spotted clones were used as parents. All these returned a "no virus detected" result. In 1994 we again sent samples of the same clones along with samples of pieces of newly acquired stud plants and samples of seedlings with red flecked parents. This time we received a positive on one clone not a red flecked clone. All others including those previously tested were "no virus detected". Because of suspicious leaf markings some of these were tested twice, a week apart. Thus there is no valid reason, or evidence, to condemn all plants carrying these characteristics as being carriers of virus. We, with the assistance of Don Gowanlock, will now carry out a set of tests, one of which will be to exchange sap between a red flecked clone in which no virus has been found and a normal flowered clone. We also know of virused *D. speciosum* that flower normally?

Another point of interest is the belief that dry seed does not contain virus, speaking to people who work on plant virus daily, some orchid viruses may survive in dry orchid seed for possibly 10 years. So dry seed culture versusa virus free stud collection is no option.

There are other native dendrobiums around with similar and other unusual markings, we flowered some seedlings of *D. kingianum* 'Speckles' X 'Freckles' with flecking in the flower similar to orchid fleck symptoms so this was also tested and returned "no virus detected".

We don't have to go out of our way to find new orchid viruses, they find us! There are already two new (to Aussie native orchids) viruses that are causing great concern in those collections that are affected by them. A slow moving (in terms of movement within the plant) Rhabdo Virus and a fast moving member of the Cymv family. Also of importance is the possible transmission of viruses by the orchid beetle and other insects.

The late Dr Neil Gough in his paper on the orchid beetle found they wintered on epidendrums and cymbidium flowers (both of which are known to carry viruses in many instances). They then munch merrilly on the *D. speciosum* flowers, seed pods and new growth. Other ways of spreading viruses are by plants at shows and meetings rubbing together, insects, cutting tools and our hands, some of these viruses may be transmitted by pollen and other parts of the flowers when breeding.

At present Mr Don Gowanlock, researcher in viruses at the University of Queensland and currently working on a virus project for the Australian Orchid Foundation is checking a report that recently collected *D. speciosum* have tested positive to virus.

We, the growers of our unique native Australian orchids, must work together to control these beastly diseases so if you have a suspect plant and its a favourite of yours get it tested, it only costs around $10.00, and if, when on a bushwalk or picnic and you see some suspicious plants, take a photo of them or report it to Mr Gowanlock. Do not take a sample as all orchid plants are protected by Conservation Laws.

Your sincerely, J. T. Woolf ✤

LETTER TO THE EDITOR

37 Brocklesby Road,
Medowie, N.S.W. 2318
30th November, 1994

Dear Wal,

I received my *Orchadian* today and I am very pleased with my article and the photos.

However, I would appreciate it if you could publish a correction in the next issue. On page 245, right hand column. The first paragraph commences " 'KWR 136' is very easy . . .". The final part of this paragraph reads ". . . up to 30mm across". This should read ". . . up to 80mm across".

Hoping this can appear in the next issue, I am,

Your sincerely,
Bill Morris

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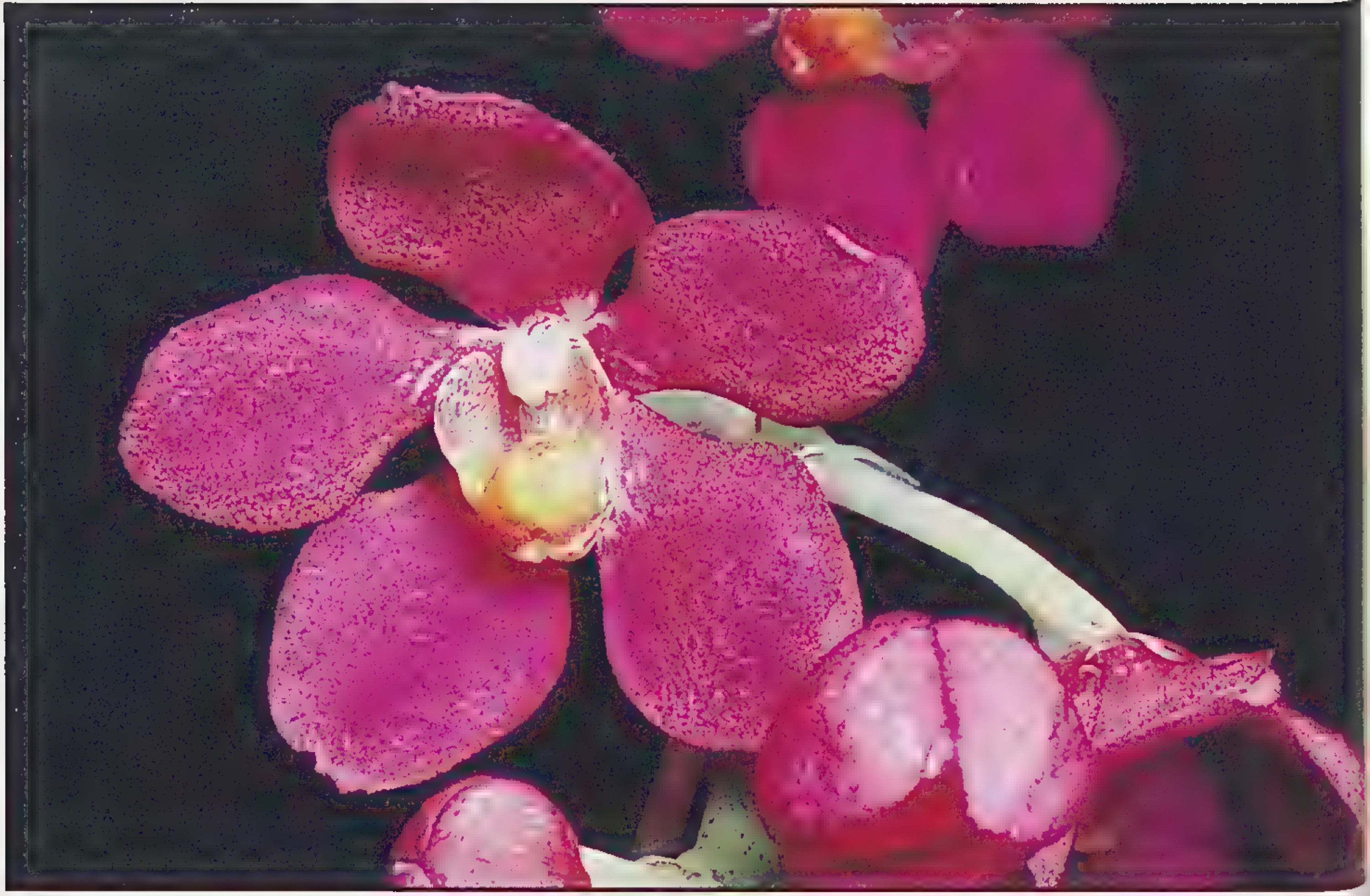

Plate 40: *Sarcochilus fitzgeraldii* 'Toska' AD/ANOS. Photo: D. Titmuss

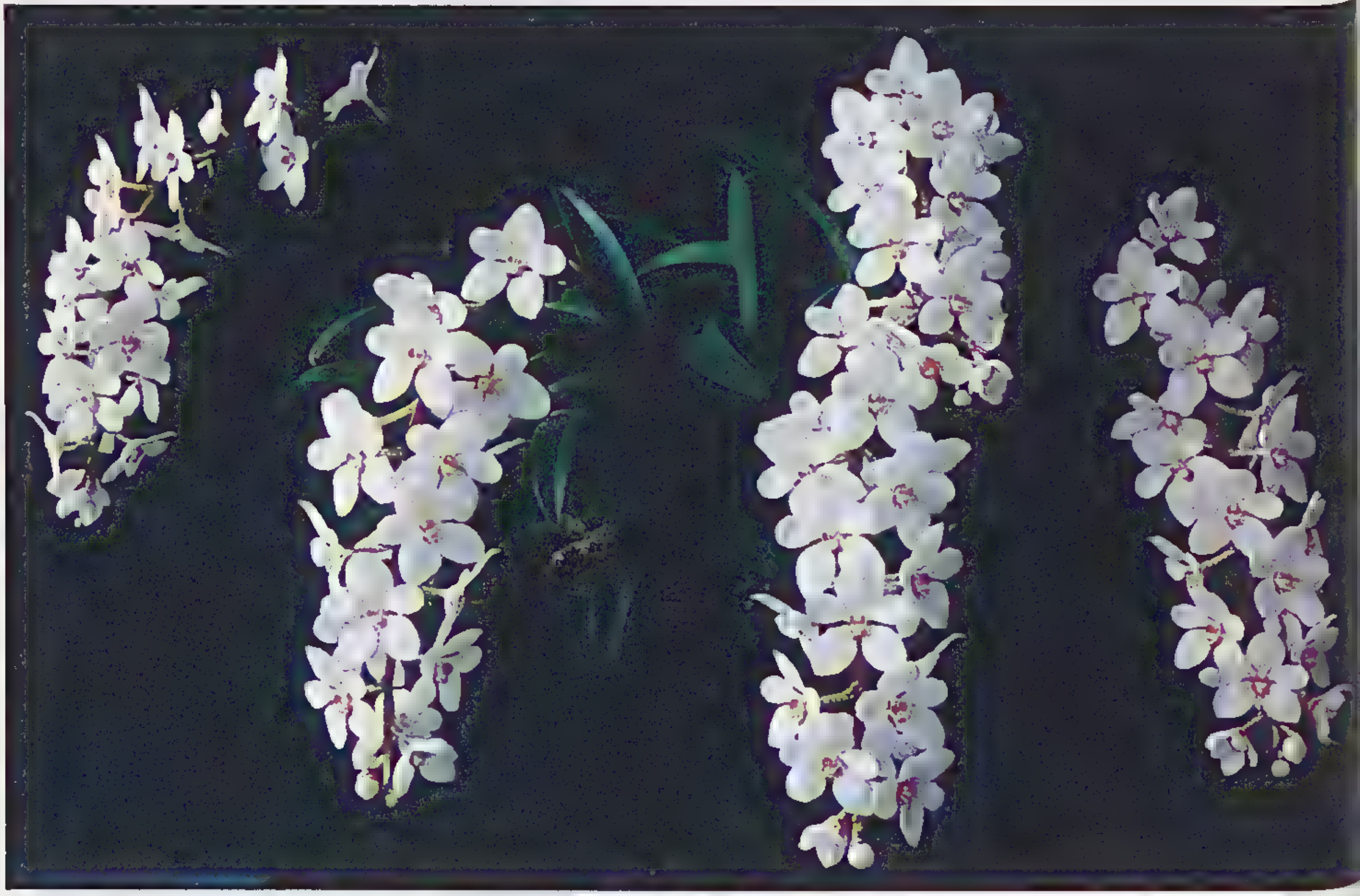

Plate 41: *Sarcochilus hartmannii* 'Highlight' HCC/NSW/ANOS. Photo: W. Upton

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TALKING POINT

In our last issue we printed Alick W. Dockrill's "Some Thoughts on Taxa and Taxonomic Categories (Particular species) of Orchids". In this issue we print Dr Colin Bower's "In Defence of New Taxonomy". It is most important to have all points of view with an ongoing discussion such as this.

It is very pleasing to notice the greater awareness of the necessity to conserve our native orchids, this becomes very apparent when reading through the many monthly newletters we receive from our groups and native orchid societies. Extinction is forever. So many areas, where our endangered species are under threat, are now being looked after by our various group members. It appears to me, not only are we looking after existing endangered sites, but are intelligently on the lookout for areas that will become problems in the future, as I have said before: "A.N.O.S. is the guardian of our native orchids".

We have another artist in our continuing series "Australasian Orchids Illustrated" her name is Vikki Harvey and her medium is pastels. I am sure you will like her *Caleana major* in this issue.

Unfortunately we cannot afford to continue to produce a 64 page issue every time, unless we increase our membership. Please, get off your tails, everyone, publicise our journal and help increase our membership, then we will give you a bigger and better journal.

We do have a colour fund, many of our members add a extra few dollars when sending in their annual subscriptions, this greatly assists us to continue to include many colour pictures each issue. The cost of publishing *The Orchadian* is more than the annual subscription rate, we have to make up the difference with our other activities. It is not our intention, at this point in time, to increase our membership costs.

Membership of the A.N.O.S. groups is far greater than those who take *The Orchadian*. Why is this? Please let me know if there is anything you would like in your journal that we do not at present provide. We aim to please.

Walter T. Upton

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IN DEFENCE OF THE NEW TAXONOMY

Dr Colin C. Bower
P.O. Box 300,
Orange, N.S.W. 2800

I found the comments of Alick Dockrill on taxa and taxonomic categories of orchids (*The Orchadian*, Vol. 11, No. 7) rather disappointing. Alick has long had my respect and admiration for his enormous contribution to Australia orchidology. It is therefore unfortunate that he should make comments which only serve to muddy the waters in relation to recent significant advances in the taxonomy of Australian orchids.

The description of large numbers of new species over the past eight years or so (for example: Clements, 1989; Jones, 1991; Hoffman and Brown, 1992) has been very difficult for many orchidologists to accept as it involves the overturning of long established perceptions about the diversity and status of Australian orchids. A natural reaction to these changes has been a questioning by some of the basis on which they were made.

For other orchid enthusiasts the past 10 years has been an exciting time in which a succession of new insights has been revealed by the intense research efforts now taking place. I count myself in the latter group and along with many others, take some pride in making a contribution to the current detailed survey and collection effort over the whole continent. This work is the first co-ordinated, comprehensive study of the entire Australian orchid flora. As such it is unravelling the fascinating diversity of our orchids in a way that has not been possible before.

A couple of important points about this work need to be made. Firstly, most modern orchid botanists are qualified professionals. In the past Australian orchidology has largely been developed by part-time amateurs, talented though they may have been. Current orchid botanists have more time, better facilities, greater resources and are better trained than their predecessors. Secondly, modern transport and communications has allowed botanists to travel frequently to investigate populations in the field and to receive fresh material for comparative studies from a large network of collectors. They have also been able to visit overseas herbaria to examine previously inaccessible type specimens, thereby clearing up a host of misconceptions. This quite exhaustive study has provided a much greater understanding of the plants; how and where they grow in the wild and how much variation there is within and between populations and geographical regions. Only after a comprehensive understanding of a group has been gained, are decisions made about the possible delimitation of new taxa.

Which brings me to Alick Dockrill's comments. To demean the work of modern taxonomists as being based only on "calculated guesswork, presumption, supposition or intuition" is to completely misrepresent the process. All the new orchid species with which I am familiar are based on discrete, consistent, observable differences. It is quite dangerous for Dockrill to dismiss the decisions of taxonomists as "opinions" that "we are not bound to follow". This is a recipe for chaos. If we were all to choose whatever names we liked from the literature, total confusion would be the result. The reality is and commonsense dictates, that we should follow the names in the latest correctly published taxonomic treatment. For example, if someone chose to call *Chiloglottis seminuda* by its old name, *C. reflexa,* how are we to know whether he is referring to *C. trilabra, C. anaticeps, C. sphyrnoides, C. seminuda, C. diphylla, C. reflexa* sensu stricto or several other taxa? To use *C. reflexa* for these species is meaningless.

I have had the opportunity to observe many of the recently described species in the field, particularly among terrestrial genera such as *Pterostylis, Caladenia* and *Chiloglottis.* There is no doubt in my mind of the specific distinctness of the new taxa I have seen. They exhibit quite marked and consistent differences from each other with no intergradation or overlap. An example is *C. anaticeps* described by David Jones in 1991. This species has a distinct, easily visible, S-shaped callus at the base of the labellum quite unlike that in other species in the *C. reflexa* complex. The lateral sepals are also held consistently at a distinctive angle. It is known so far from only two widely separated localities, Werrikimbe and Cathedral Rocks National Parks in N.S.W., but shows considerable uniformity between the two areas. Similarly, *C. platyptera*, also described by Jones (1991) has unique broad column wings, unlike its near relative *C. formicifera*. Populations of *C. platyptera* from widely separated areas (Barrington Tops and Yarrowitch, N.S.W.) also show considerable uniformity and occupy quite different habitats to *C. formicifera*.

Despite Dockrill's scepticism it is possible to prove that two taxa are different species. This can be done in at least two ways; pollinator specificity, or genetic analysis using chromosome counts, enzyme electrophoresis or DNA fingerprinting. Both pollinator specificity and genetic analysis have been used in recent studies. These powerful techniques provide scientifically indisputable evidence of genetic isolation, the key concept in species differentation.

My own studies on *Chiloglottis* have shown that the new species have consistently different pollinators and that each species has the same pollinator throughout its distribution. In sexually deceptive genera it is possible to demonstrate pollinator specificity in scientifically designed field experiments, which I have used extensively (Bower, 1992; 1994). Dockrill's statement that pollintor specificity "is **not** a reliable guide" to species definition is not true in relation to the sexually deceptive Caladeniinae. It is only in the Caladeniinae that pollinator specificity has been used as a taxonomic character, not more generally as Dockrill incorrectly implies.

Dockrill's argument for retention of a "broad rather than narrow species interpretation" is particularly weak. It is clear from the detailed study of many complexes that large numbers of legitimate species have been overlooked in the past. This was largely because past workers did not have access to the breadth of material available to modern workers. Many of the new taxa are so distinctive there is little doubt they would have been described earlier had adequate material been available. As a result enormous variation has been included in many broadly interpreted species. Terrestrial examples include *Pterostylis rufa, Chiloglottis gunnii, Caladenia carnea* and many others. There is no reason to think the situation with epiphytes is any different.

It seems peculiar to me that a significant number of orchidologists appear to consider the last word on orchid taxonomy was uttered some time before 1980. The fact is that current revisions of all Australian plant families are defining significant numbers of previously unrecognised species. Taxonomy, like any other branch of science, must respond to technological advances which allow new insights and to new knowledge of plant biology. In all families but the orchids, this is generally accepted as prefectly normal and reasonable. What is it about orchids and orchidologists that normal taxonomic activity should generate so much angst?

ACKNOWLEDGEMENTS

I wish to thank the Australian Orchid Foundation for its financial support of my studies into the pollination of the Caladeniinae.

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RE-ESTABLISHMENT OF A RARE ORCHID HABITAT AT PEATS RIDGE, N.S.W.

Ian Slade
R.M.B. 1461,
Peats Ridge, N.S.W. 2250

The area to be re-established is an outcrop of basalt on the eastern side of Popran Creek at Peats Ridge, N.S.W. This is, or rather was, a unique area of dry rainforest on steeply sloping land with a northerly aspect, covering approximately four hectares.

I first walked this area when I was still at school in the fifties. The basalt had been quarried in a very small area at this stage, therefore 99% of the rainforest was still intact. It was not until the seventies that quarrying was stepped up with an influx of machinery. During the eighties the rainforest was almost totally destroyed by explosives to loosen the basalt.

At that time the small amount of rainforest left was confined to the northern face. It comprised Red Cedars (*Toona ciliata*) and quite a number of very large fig trees (*Ficus rubiginosa*). These fig trees were the hosts of a large colony of orchids including *Dendrobium teretifolium* var. *fairfaxii,* (*D. fairfaxii*) and *D. speciosum* var. *hillii* (*D. tarberi*). The *D. speciosum* var. *hillii* had long racemes of very white flowers, typical of this species, but they were very small.

Steve Clemesha, who has researched *D. speciosum* and its varieties, was interested to learn that the variety hillii was growing in this area. I sent numerous racemes to him and he verified that they were indeed *D. speciosum* var. *hillii. D. speciosum* var. *speciosum* did not to my knowledge occur in the basalt area, but is found nearby on sandstone outcrops. *D. gracilicaule* grew in this area in large numbers and hybridised with the *D. speciosum* var. *hillii* to produce *D. Xgracillimum,* the hybrid being quite a reasonable form.*D. Xgracillimum* was quite a common orchid for such a small area.

Other orchids growing in this habitat were *Sarcochilus falcatus* — the large flowered form which blooms in November — *Bulbophyllum elisae* and *B. shepherdii* — *Sarcochilus olivaceus* was found growing in the area of the rainforest where there was a greater amount of moisture, this was toward the bottom of the slope. *S. hillii* was growing on the drier edges of the rainforest and extending out into the eucalypt forest, where it formed colonies on the myrtles. On the northern face there was a large spur of basalt which hung over the valley and it is reported that on this spur were plants of *S. ceciliae.* From the description given by the early workers of the quarry the plants could not be anything else but *S. ceciliae.* As I was not fortunate enough to see these plants it will always remain a mystery, particularly as the spur was demolished.

The northern face of the quarry was eventually blown out by explosives. This resulted in a virtually complete destruction of the rainforest and actually buried the huge fig trees, etc., along with most of the orchids.

The situation now is that the remaining area will not be quarried, resulting in a beautiful area, which is rare in the Hawkesbury sandstone region, being saved from virtual destruction. Fortunately, with our current laws, the earlier destruction of this unique orchid habitat would not have been allowed to happen.

The quarry management has now agreed to re-establish the rainforest and eventually allow the orchids to regenerate. Pockets of orchids are still present within the intact rainforest and it has been recommended that it be rehabilitated and extended to preserve an example of this rainforest and orchid flora in the district. The plan is to introduce bush regeneration practices and extend the rainforest so that it forms a corridor to the newly gazetted Popran National Park. This is a positive environmental approach by the quarry management, with the aim of preserving an important flora type in the region. ✾

SARCOCHILUS BREEDING

W. Morris
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Medowie, N.S.W. 2318

The two articles in the last issue of *The Orchadian* (March, 1995) by David Banks and Frank Simpson on the breeding of *Sarcochilus* were illustrated by many photos of colourful plants. The articles and the photos showed that much progress has been made in producing new and colourful flowers. However to me it seems that little progress has been made in producing larger flowers in this genus. All the photos in the two articles are of quite small flowers and are markedly magnified in the reproductions.

Although a potful of *S. hartmannii* in full flower with many racemes open is very attractive, to me it would be much nicer if the individual flowers were at least twice as large. Even X2.5 would not seem to me to be out of proportion, so I am writing this letter to appeal to hybridisers to attempt to markedly enlarge the flowers of *Sarcochilus*.

I realise that to some growers such an appeal is akin to heresy but there are others to whom a larger flower would still appeal.

The largest well-shaped flowers I have seen have been on various clones of *S.* Melba and I have heard many comments such as: "Wow, look at that flower!" when such a plant is exhibited.

It seems to me that the breeding of *Sarconopsis* hybrids must have been with the object of enlarging the *Sarcochilus* flower and I am sure that if the former weren't so difficult to grow and breed they would be widely grown and appreciated. The "small labella" mentioned by David Banks would, I am sure, be rapidly bred out of the hybrids if they were less difficult to breed further.

The size of *S. fitzgeraldii* is being "improved" by using the cultivar "50 Center" and when the shape can be filled in, in another generation or so, a spectacular flower should result. However, *S. hartmannii* breeding seems to have concentrated on shape to the exclusion of size as the more perfectly shaped flowers are usually smaller than the more open ones.

To achieve larger flowers and at the same time to retain reasonable shape, breeders should probably look to *S.* Melba, *S.* Fitzhart, *S.* Melody and the larger, newer "fitzgeraldii" clones. The larger "Melbas" have been bred from large flowered forms of *S. falcatus* so other "falcatus" hybrids of large size could be included. some clones of these hybrids already have quite a bit of colour, so breeding for size should not lose colour or produce mainly white flowers. Simultaneous breeding of *S.* Melba, large *S. fitzgeraldii* and large *S. falcatus* clones with the colourful hybrids as illustrated in *The Orchadian* articles could produce larger coloured flowers to be incorporated in a breeding programme for larger flowers.

Although catalogues often suggest that a particular cross may produce "large, well shaped" flowers or the result should be "large and colourful" I have never seen one saying "line bred to produce larger flowers". We have line breeding to increase colour and to improve shape but not to increase size. Why not? I can envisage *Sarcochilus* flowers bred to resemble small *Phalaenopsis* with flowers 5–6cms which will grow cool and come in all kinds of colours.

Let's start to deliberately hybridise in this direction. Anyone who prefers the small dainty flowers of the present style of plants can obviously continue with this line but for others, bigger is beautiful too.

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JON CARA — A YOUNG A.N.O.S. MAN WHO SEES THE BEST IN NATIVE ORCHIDS (ESPECIALLY IF THEY ARE *DENDROBIUM SPECIOSUM*)

Andrée Millar
Clontarf, Queensland
with June Cara, Jon's mother

Jon Cara (Plate 1) is a young man who loves native orchids and who loves his orchids with a deeper appreciation of their beauty than most of us, because he **sees** them. Every plant he looks at he studies minutely, until he tells himself he knows all about it and how it grows.

Jon Cara cannot speak or hear, because his mother was a victim to Rubella, the worst kind of measles.

As a child he showed an interest in plants, so June drove him to flea markets; his first love was *Dendrobium speciosum.* He began to collect them and has about 200 now, all purchased from legitimate sources. One day at a flea market he saw and bought a *D. tetragonum* var. *giganteum,* doubtless someone will rewrite his labels — "Clementise" them and correctly write *D. cacatua.*

When Jon turned 18 years of age he was given an apprenticeship in cabinet making and today at nearly 30, he is still working as a cabinet maker. As his orchid collection grew, be built himself a small state-of-the-art shadehouse 20 feet by 10 feet by 15 feet high.

When Jon was brought to me by Ted Thorogood (member of A.N.O.S. Kabi Group, Queensland) we spent three hours writing to each other, my questions and his answers at first, Jon has learned to associate words with the results he gets, his memory is phenomenal. As his interest in orchids grew, he became a discerning collector, he fixed his eyes on the *Latouria* section of the New Guinea dendrobiums (plates 2 & 3). He achieved his goal with a beautiful plant of *Dendrobium forbesii* 'Son' (Plate 4), with this he won an HCC/QOS–AOC in 1993, he wrote in answer to my written question: "Is the dark purple and brown form".

Jon went to the Second Australasian Native Orchid Conference and Show at Toowoomba and bought a flask of the rare *D. alexandrae.* The species Schlechter describes as: "This magnificent species represents the first close relative of *D. spectabile* (Bl.) Miq., but it differs completely in the labellum" and it was so beautiful he wrote: "I have dedicated this species to my wife Alexandra . . ." Jon has 25 small plants now and they are getting a lot of extra T.L.C.

At the A.N.O.S. show he met Ted Gregory who immediately proposed him for membership of the Native Orchid Society in Brisbane and he goes to the meetings now. He asked me if it was a good thing and I, of course, said yes, the more chances he gets to see native species the easier it will be for him to recognise them in other places.

Four years ago he joined the Maroochydore Orchid Society and he is enraptured with the show bench, "so many colours, so many plants". As I said he is an instant connoisseur of extra special plants. He visited Coral and Barry at their nursery, Anderson Orchids at Pomona and bought a lovely plant of *D. laevifolium,* which he was quick to say originally came from Geoff Stocker's place.

Of course, we are all sorry that our National Medicine Programme was off the mark, but if he cannot hear or talk, he is ahead of us all with his keen eyes, intelligence and memory. Jon is a credit to all we stand for in A.N.O.S., we match ourselves with courage and faith, as he does and pray that some day we too might find a *D. alexandrae* and give it the caring love that Jon does. ✾

Plate 1: Jon Cara.

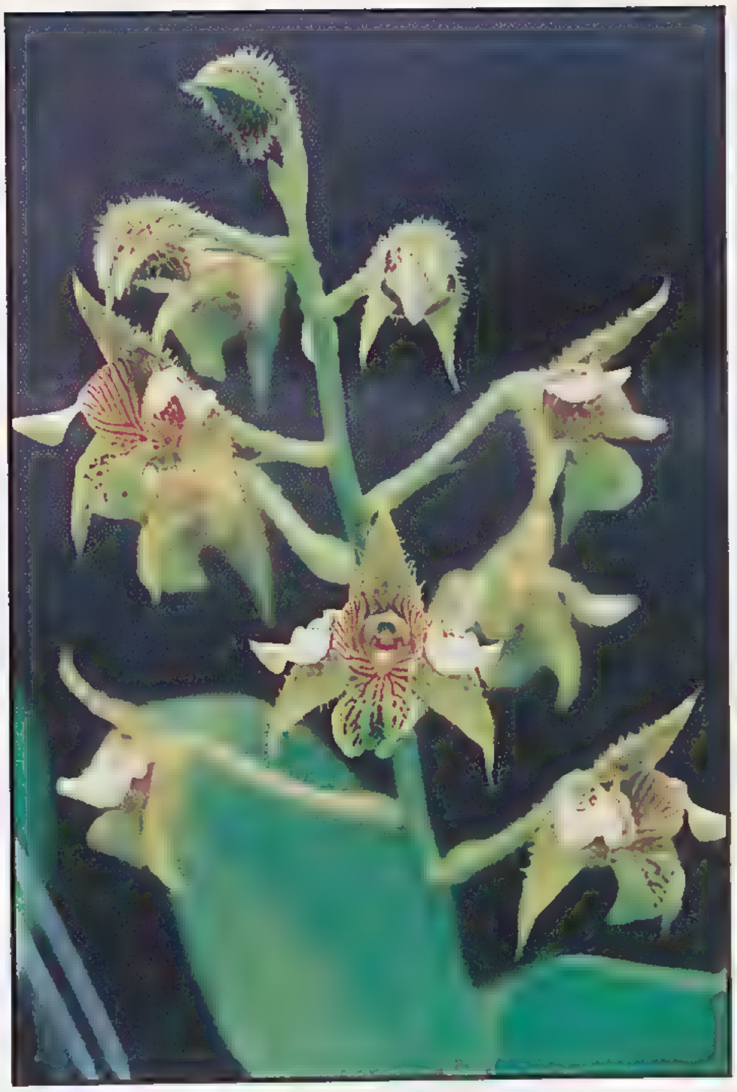


Plate 2: *Dendrobium macrophyllum.*

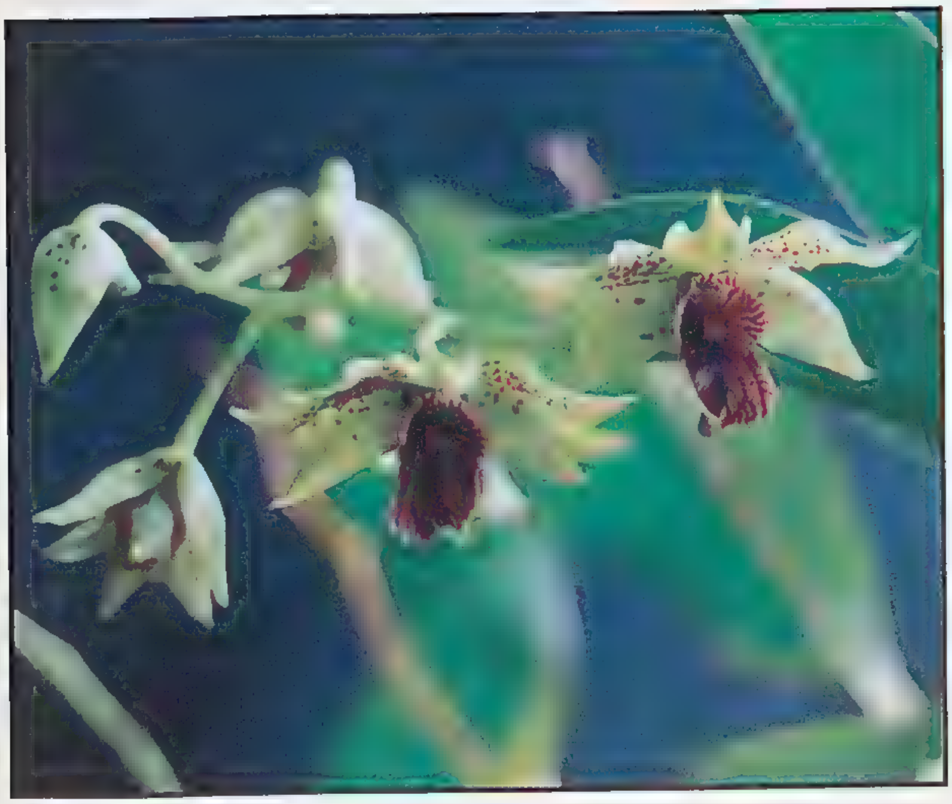


Plate 3: *Dendrobium* Andrée Millar.

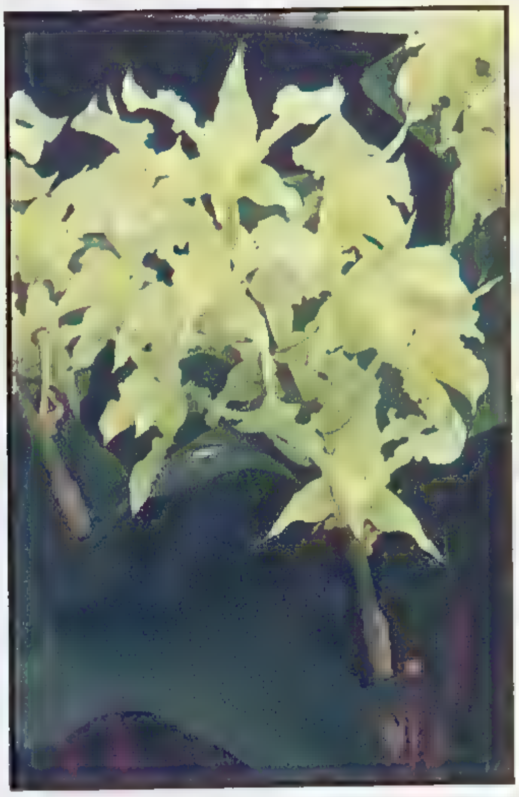


Plate 4: *Dendrobium forbesii* 'Son' HCC/QOS–AOC.

AUSTRALIAN *LIPARIS* SPECIES (Part Two)

Roy Gifford
2 Warrah Street,
Ettalong, N.S.W. 2257

Liparis collinsii Gray, Austrobaileya 3(4): 581-583. Nov. 1992.

I have never seen this species and know nothing about it beside its name and that it is a terrestrial species and can only direct anyone interested to the reference.
[Ed.—Original description, reprinted from Austrobaileya, on page 370].

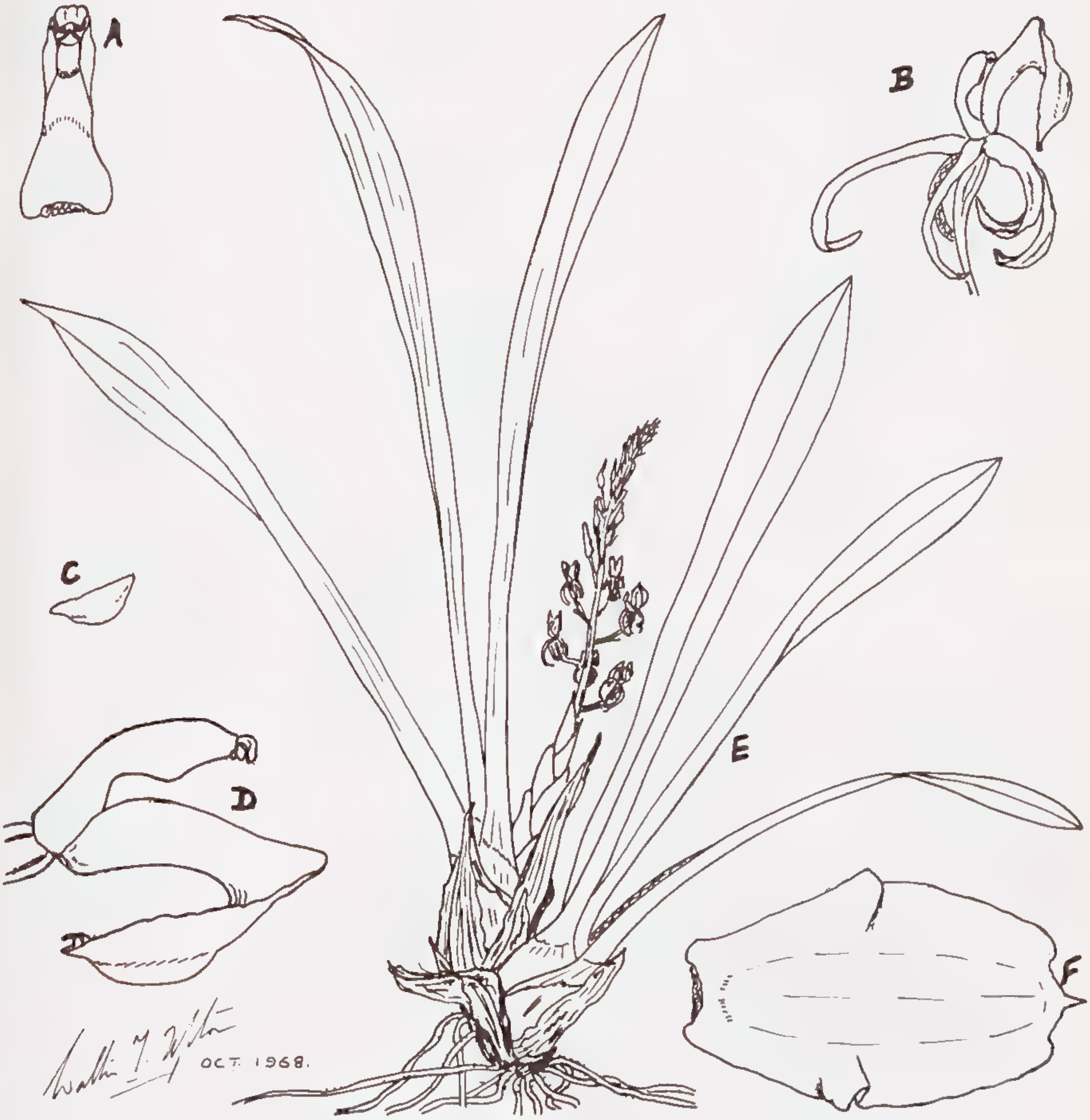
Liparis nugentiae Bailey (Plate 5) Bot. Bull. Dept. Agric. Qld. 14.: 11 (1896).

This species has the largest growth of the Australian species I have seen, with pseudobulbs up to 8cm long, flattened and roughly oval, some 4–5cm wide and overlapping with little rhizome. They are soft and fleshy, pale green and old leafless growths usually retain the dead basal parts of sheaths and leaves as tight brown bands which can be ignored by growers for they offer little shelter for bugs — scale, aphids, etc. There are three or four pale green sheaths protecting the new growths which are short lived and mostly fall early, while growths have 3–4 pale green leaves up to 25cm long by 3cm wide, deeply channelled at the base with a bluntly pointed tip. Unlike the other Australian epiphytic species I know, the leaves of *L. nugentiae* are quite thin and tough.

The erect or gently arching inflorescence appears with the new growth and may reach 25–30cm long, of which the apical quarter is rachis bearing 6–25 blooms depending on the maturity of the plant and clonal differences. The flowers are well spaced with sepals and petals about the same lenth — up to 12mm long — the sepals some 2mm wide, the petals much narrower, all sharply reflexed around the ovary and often twisted as well. The labellum is 14–16mm long, ascending for the first 7–8mm then bending sharply down with two high pointed shoulders at the bend. The apical half narrows gently to a blunt reflexed tip. There seems little variation in floral colour, with all plants I've seen or grown having blooms mostly green with a touch of brown, rarely clear apple green and occasionally pale brown. Blooms have a perfume which is not for the lounge room but it is not pervasive and hard to detect from a short distance, while flowers last some 10–12 days.

Plants are endemic to the ranges of North Queensland where they grow as epiphytes — rarely lithophytes — in rainforest above 800m from about Mackay to north of Cairns. In my salad days I saw very large clumps on trees, usually on trunks or main branches, on nearly every stream I climbed and occasionally masses on mossy rocks. In the forest, plants bloomed from early spring to mid summer as growths emerged and a large mass in full bloom was quite impressive, though not the ideal place to sit for a cuppa tea, for such plants did make their presence felt if there was no breeze. Plants bloom much better in bright light and also favoured spots in the forest where breezes were constant — not hard to find on the eastern slopes.

Under cultivation the couple of plants I once tried in Townsville on the north coast soon died in the humid summer, but I grew and flowered quite a lot of clones at Ettalong on the N.S.W. Central Coast. They would not grow in my bushhouse, the trial plant I put there frying in the first hot summer wind, but in the warm house I did not have too much trouble with plants potted in shallow terracotta pots or mounted on large slabs of tree fern fibre. In pots I used a well drained but water retentive compost, while plants on slabs were always backed by epiphytic mosses, local if I could get it but often moss from India or Thailand which I grew especially for backing plants. I always had fans keeping air gently moving in the



Liparis nugentiae Bailey

Cairns area

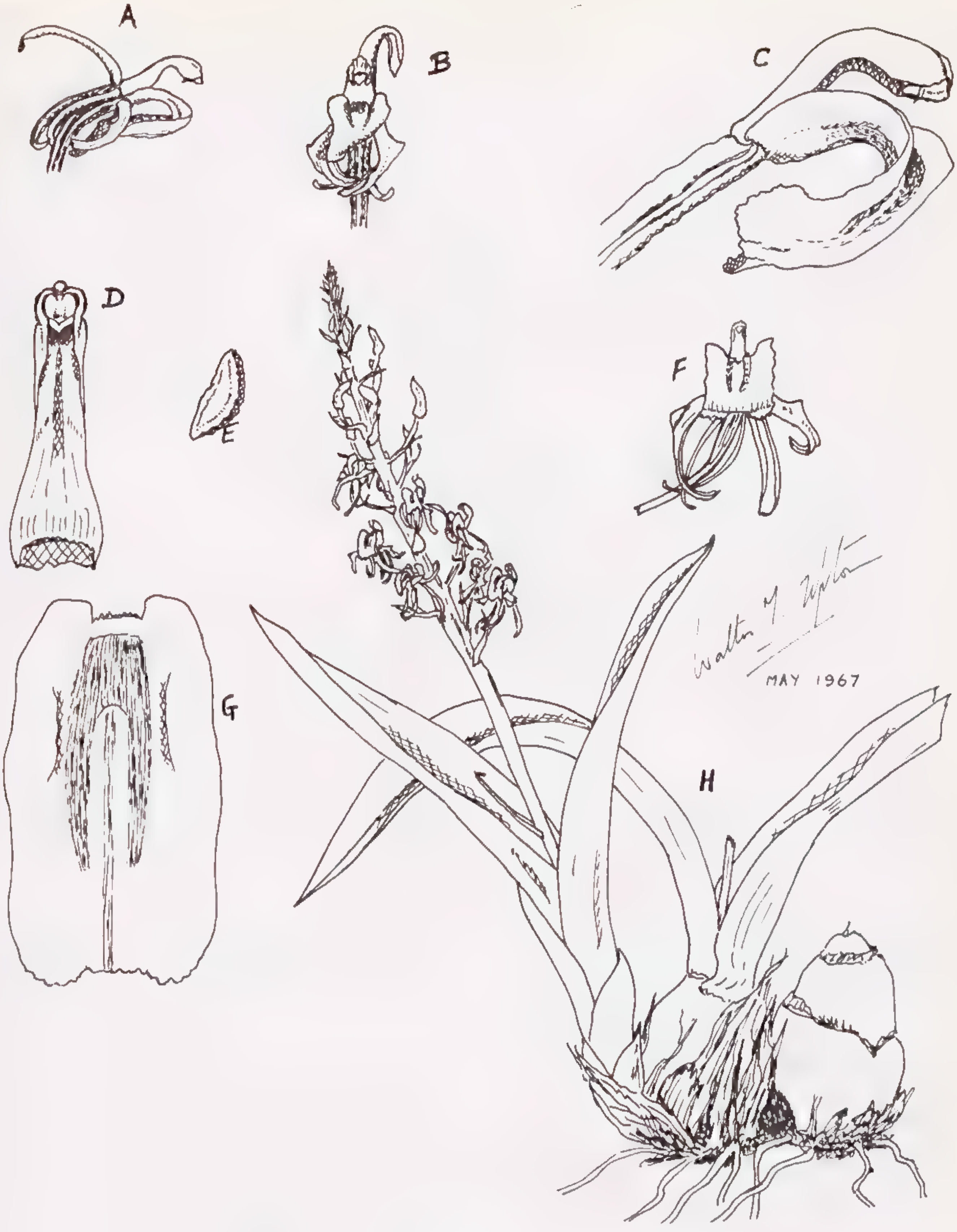
A. Column, front view	4X	D. Column & labellum, side view	4X
B. Flower, side view	2X	E. Plant	approx. 1/5thX
C. Pollinia	approx. 20X	F. Labellum, flattened	4X

house, fed every second watering with weak nutrients, gave plants 50–60% shade and kept winter temperatures at 12 degrees C. In summer I had a system of micromisters rigged so that I could keep temperature below 30 degrees C. on the hottest days, a welcome side effect being the maintenance of humidity at the same time. Grown thus I found the species grew well enough and extended its flowering season considerably, beginning a couple of weeks earlier and ending in late summer — this mainly because I found that plants which made early growths would often get another flush of growth later in the season. The most spectacular of the Australian species I know and a plant with 20–30 racemes is very nice, especially if one has a clone with clear green blooms.

Liparis reflexa (R.Br.) Lindl. in Edwards's Bot. Reg. 11: sub.t. 882 (1825).

This is probably the best known endemic species of the Australians for it is very common and has the widest range of them all, being found from the Victorian border up into south Queensland from sea level to above 1,000m on the eastern slopes of the ranges. It is almost exclusively lithophytic, likes bright light and is found in huge masses on rocks throughout its range wherever conditions suit it — and plants are far from fussy. Pseudobulbs are 3–5cm high by 2–3cm across, soft and fleshy and pale yellow/green in colour. There are 3–4 soft sheaths protecting the new growth and the emerging inflorescence and 2–3 pale yellow/green leaves, very thick and fleshy and up to 25cm long by 2–3cm wide, somewhat channelled with a bluntly pointed tip. Plants produce a simple raceme which is usually upright, up to 25cm high with 2–3 loose sheaths below the rachis which is about half of the whole and may carry 10–30 flowers. The sepals and petals are 10–18mm long, the column in the same plane as the ovary, the dorsal sepal starting at a right angle to the column then usually curving out and down with the tip curled under. The lateral sepals also start out straight from their point of attachment then curve gracefully down and around the ovary. Sepals are about the same length, 8–10mm, the dorsal slightly narrower than the laterals. The petals are a little longer than the sepals and around half their width and hang almost straight down beside the ovary, though slightly twisted or curved. The labellum is about 8–10mm long by 3–4mm wide when flattened, upright and incurved for about the first half, then curving gently down and under with two blunt shoulders at the curve, the tip variable in shape from broadly pointed to almost square, with some degree of a cleft on some clones. There are two bright yellow stripes on the lip, commencing as raised calli on the erect portion and becoming flat on the broad section. There is little variation in floral colour, blooms usually yellow/green, with some slight difference in the dominance of either colour from clone to clone being all I have ever noticed. Plants bloom mainly from late summer early winter in the forest and keep the same times in temperate bush houses. Flowers last 8–10 days, seem to be ant pollinated and to attract their pollinator have developed a distinctive perfume which has earned the species the common name of the "cat's urine orchid" — though some of my more uncouth friends shorten one word a bit.

Under cultivation this orchid will not grow outdoors in the coastal tropics but should do well enough in tropical high country above 1,000m or so. In temperate areas it is among the easiest of bush house plants, growing quite happily in a pot of any size in almost any compost, thriving in the garden if plonked on a rock with a bit of afternoon shade and asking only an occasional watering, though it will react quite spectacularly to some T.L.C. in the form of some feeding now and then. Will survive and flower anywhere out of frost.



Liparis reflexa (R.Br.) Lindley

Sydney area

A.	Flower, side view	2X	E.	Pollinia	approx. 20X
B.	Flower, front view	2X	F.	Flower, front view	2X
C.	Column & labellum, side view	6X	G.	Labellum flattened	6X
D.	Column, front view	8X	H.	Plant	⅔rdX

Plant 1: A–E and G. Plant 2: F and H.

Liparis simmondsii Bail. Bot. Bull. Dept. Agric. Qld. 3:18 (1891).

This is the third and last terrestrial *Liparis* endemic to Australia, which is very poorly represented by terrestrials of this genus and is found growing on the forest floor in rainforests of the coastal ranges of northern N.S.W. and southern Queensland, where it used to be relatively common on creek flats at altitudes below 800m. There is also a population in the high forests of north Queensland, though personally I never saw it there.

To my mind this is the most attractive of all the Australian *Liparis*, for the flowers — though few — are beautiful and the foliage of a healthy plant repays the time and effort of growing it, even should it never flower and orchids worth their place as foliage plants are not **that** common. Plants grow among the leaf litter in pretty shady places, the pseudobulbs above the ground but usually covered by litter and the roots do not penetrate the soil to any depth, mostly skidding around in the rotted leaf mould. They are much commoner on creek flats where there are more even surfaces but will establish in pockets of leaf mould on gentle slopes. Pseudobulbs are soft and fleshy, slender and tapered cylindrical, 7–12cm long by 2–3cm in diameter at the base. To keep above the litter new growths are often produced from eyes at the first node above the base of the old growth — 2–3cm above the base, thus keeping the foliage clear of any litter buildup. There are two or three almost terminal leaves with long — 3cm — hollow stalks and broad pleated blades which are a deep rich velvety green, oval, up to 15cm long by 7–8cm wide, the tips pointed.

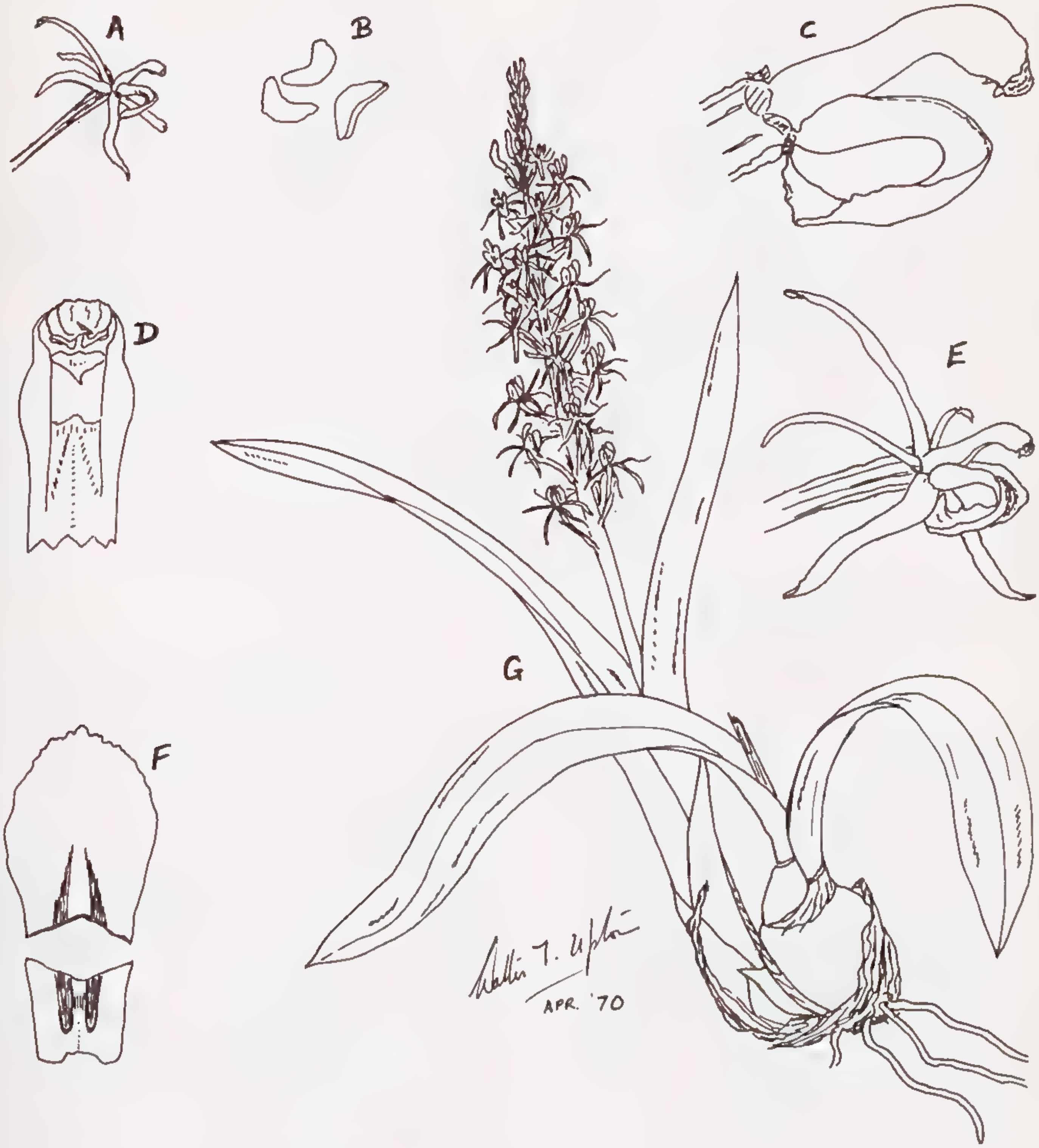
The inflorescence, a simple raceme which is almost square in cross section, appears with the new growth and may reach 20–25cm long, the last quarter being rachis with up to 15 flowers — usually less. The pedicel and ovary are upright with the sepals and petals reflexed and twisted at various angles. Sepals and petals are long and narrow, the dorsal 9–12mm long by 1mm wide, the laterals shorter, 8–9mm, but wide — 2mm on average. The petals are 9–10mm long by less than 1mm wide, the labellum pear shaped when flattened but incurved for the first half, then bent gracefully to present the flat rounded lower half to its pollinator. The erect column is bright green with the sepals and petals deep glowing red, royal purple, or more commonly, a combination of both, a lovely reddish purple. A very nice miniature whose only falt is the scarcity of flowers.

I have never grown *L. simmondsii* in captivity as I grew no orchids while I was roaming the Blackall Ranges where I saw it, but I imagine it would not present many difficulties to anyone with experience in growing delicate terrestrials. A rich well drained compost with a cool shady spot in the bush house in temperate climes, but I think an evaporative cooler would be needed in tropical lowlands. Well worth the effort for anyone lucky enough to procure a plant.

Liparis swenssonii (Plate 6 and 10) Bailey Qld. Agric. Journal 16(9):564 (1906).

This species has hidden itself from identification for almost 90 years since it was named and it is only recently that it has been determined to be the plant that some of us grew for years and regarded — with some disdain — as the small flowered form of *L. relfexa.* The plant is virtually identical with the latter species except that the flowers are smaller, but some modern taxonomists have decided that there are sufficient differences in the flower structure to justify specific status.

I must confess that I grew both for many years, flowered them together every year and could never see any significant differences in plant or flower.



Liparis swenssonii Bailey

Macpherson Range, south-east Queensland

A. Flower	2X	E. Flower	4X
B. Pollinia	approx. 20X	F. Labellum flattened out	6X
C. Column & labellum, side view	8X	G. Plant	⅔rdX
D. Column, front view	16X		

Plants grow naturally as lithophytes along the eastern ranges of northern N.S.W. and south-east Queensland in the same habitats as *L. reflexa* — though not over the extended range of that species — that is, on almost every rock in some areas, in rainforest or open dry forest from sea level to 800m. Under cultivation treat as *L. reflexa* and it will thrive.

This completes the list of Australian *Liparis* species, of which I was privileged to see nine of the 11 in their natural habitats and grow seven with some degree of success. Though they are not spectacular in plant or flower — except *L. simmondsii* — all are worthy of a place in any collection of miniatures, especially a collection of **Australian** miniatures and I found none of the plants I grew unduly difficult.

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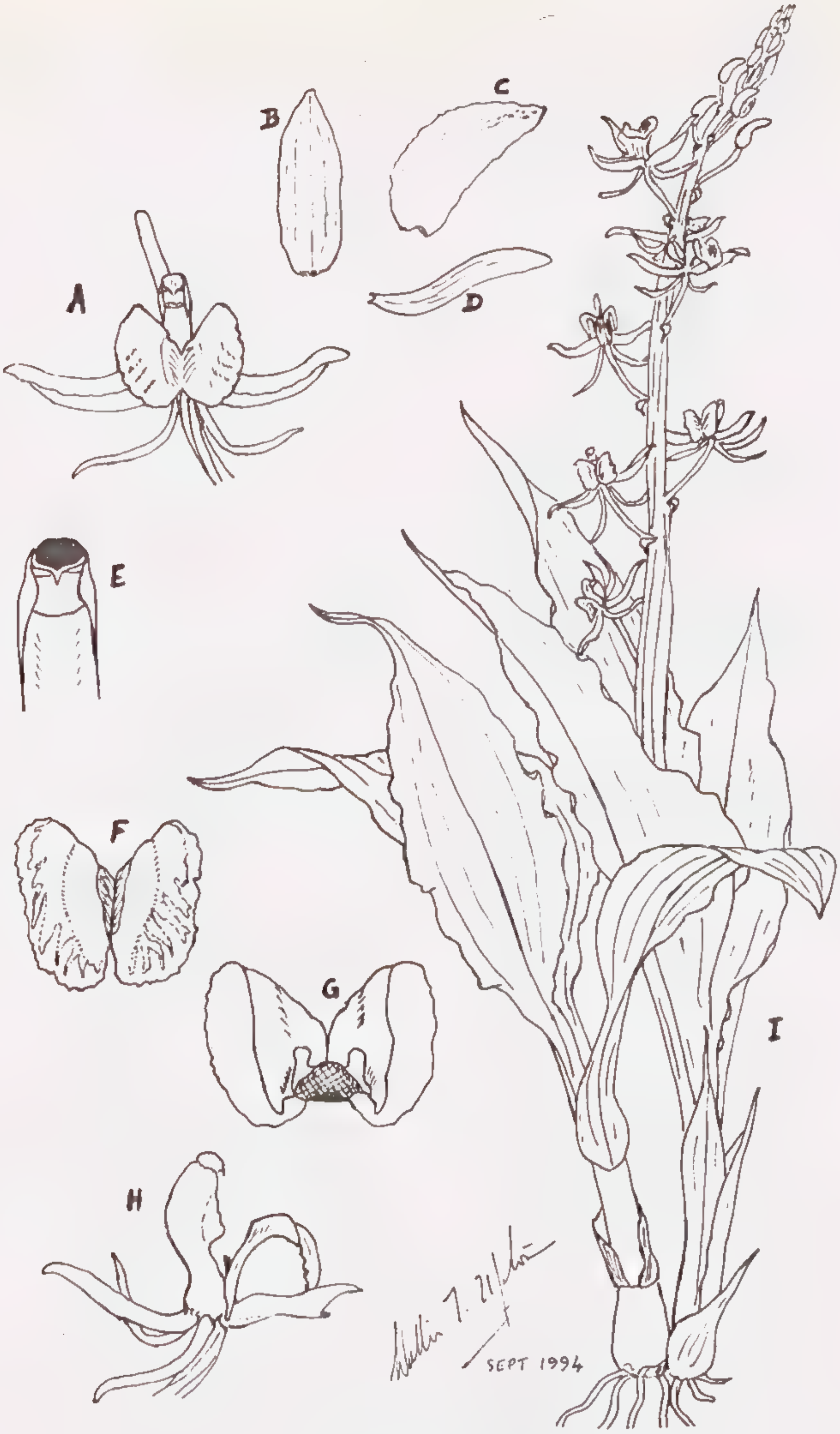
LIPARIS AFF. *SIMMONDSII*

Walter T. Upton

This plant was collected by Jean Deane in 1993 in the Tully Falls area of north Queensland. There were very few isolated plants growing amongst a number of *Malaxis* sp. said to be *M. latifolia*. It was not in flower when collected. When I first saw the plant I thought it was an unusual colour form of *Liparis simmondsii* but on closer inspection I found there were a number of differences. The inflorescence carried 23 flowers compared to a much smaller number in any of the *L. simmondsii* I had previously seen. The flowers were generally larger and the segments, when flattened out, were much wider. The apex of the labellum was emarginate instead of being mostly rounded. The stigma was not obscured by the rostellum as in *L. simmondsii* (Dockrill 1992). The colour was considerably different and there were a number of other differences.

I drew and photographed (Plate 11) the plant on the 8th September, 1994 and it was later exhibited in the A.N.O.S. Sydney Group Spring Show 1994 (Plate 8). A brief description follows:–

Largest pseudobulb was 8cm high by 15mm wide with three large sheathing bracts. Leaves ovate, five veined, two on smallest pseudobulb and three on the next size and the largest. Largest leaf 15cm long (including petiole) by 5cm wide. Petiole 2cm long and deeply channelled. Inflorescence, faintly spotted purple, erect, four angled, 26cm high. Peduncle 116mm. Rhachis 144mm 23 flowers. Flowers facing outwards to inwards and more or less upwards. Ovaries and pedicels at an angle of 45 degrees to the stem, 12mm long. Diameter of flower, across the lateral sepals, 2cm. Labellum 8mm across at front. Buds red/purple, column pale green, anther red/purple, segments green spotted and marked red/purple. Labellum red/purple outlined in pale green. Callus at the base of the labellum, dark red/purple, this callus was difficult to separate from the labellum almost appearing as if it was attached to the base of the column.



Liparis* aff. *simmondsii

Collected by Jean Deane in the Tully Falls area in north Queensland in 1993.

A. Flower, front view	2X	F. Labellum, front view	approx. 4X
B. Dorsal sepal, flattened out	2X	G. Labellum, rear view	approx. 4X
C. Lateral sepal, flattened out	2X	H. Flower, side view	2X
D. Petal, flattened out	2X	I. Plant	⅔rdX
E. Top of column	4X		

Reprinted from Austrobaileya 3(4): 581–583 (1992)

A NEW SPECIES OF *LIPARIS* RICH. (ORCHIDACEAE) FROM NORTH QUEENSLAND

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SUMMARY

Liparis collinsii B. Gray, a new species of *Liparis* Rich. section *Liparis*, is described and illustrated. In addition notes on its taxonomic affinities, habitat, distribution and conservation status are given.

TAXONOMY

Liparis collinsii B. Gray, **sp. nov.** Differt a *L. simmondsio* Bailey pseudobulbis brevioribus validioribus et foliis angustioribus lanceolatis epetiolatis basi vaginantibus. **Typus:** Cult. Atherton ex Queensland, Timber Reserve 14, Parish of Kesteven, 13°46'S, 143°21'E, 740m, 13 September 1990. *B. Gray* 5269 (holo: QRS; iso: BRI,CANB, NSW).

Erect terrestrial herb, deciduous, glabrous, 25–50cm tall. Pseudobulb fleshy, ± elliptic in cross section, broadest near the base, tapering to the apex, 6–10cm long, 2-3cm diameter; bracts 2–4, ovate, sheathing, strongly ribbed, apex acute; new shoot arising from the base of the old. Leaves (3–4)–6; lamina lanceolate, 10–13cm long, 4–5cm wide, somewhat plicate, with 4 or 5 reddish purple ribs below, margin undulate, apex acute. Petiole broad, sheathing, 5–7cm long. Inflorescence terminal, erect, a 10–20 flowered raceme, 25–35cm long; peduncle 4-angled, slightly winged, about as long as the rhachis; bracts 1 or 2, linear-triangular, 6–9mm long, 2.0–2.5mm wide; floral bracts linear, 2–6mm long, c. 1mm wide, acute; pedicel with ovary 10–16mm long. Flowers spreading widely, 2.0–2.5cm diameter. Dorsal sepal linear to narrowly ovate, 12–14mm long, 3.0–3.5mm wide, pale purplish green, margin revolute. Lateral sepals elliptic, somewhat falcate, 9–10mm long, 3.0–3.5mm wide, pale purplish cream, revolute. Petals filiform, 11–14mm long, 1.4–1.5mm wide, purple, strongly revolute (rolled into a very narrow tube). Labellum obovate, c. 13mm long, 8–10mm wide, greenish to greenish cream at the base, suffused with maroon towards the apex, ventral surface with a narrow maroon central line from the base to apex; base cuneate; apex truncate to ± emarginate; margin denticulate near the apex; semierect in the basal third, and channelled then decurved through 90° and spreading, with 2 calli on the ventral surface; calli c. 2mm long, 0.5mm diameter. Column arcuate, c. 7mm long, 2mm diameter, greenish cream. Anther cap 1.3–1.4 x 1.3mm. Pollinia 4, in 2 pairs.

DISTRIBUTION AND HABITAT

This species is at present known only from the McIlwraith Range on Cape York Peninsula in Queensland. It grows among granite boulders in relatively open areas in rainforest above 700m altitude. Plants occur in loose colonies and are leafless throughout the dry season. (June to November or December).

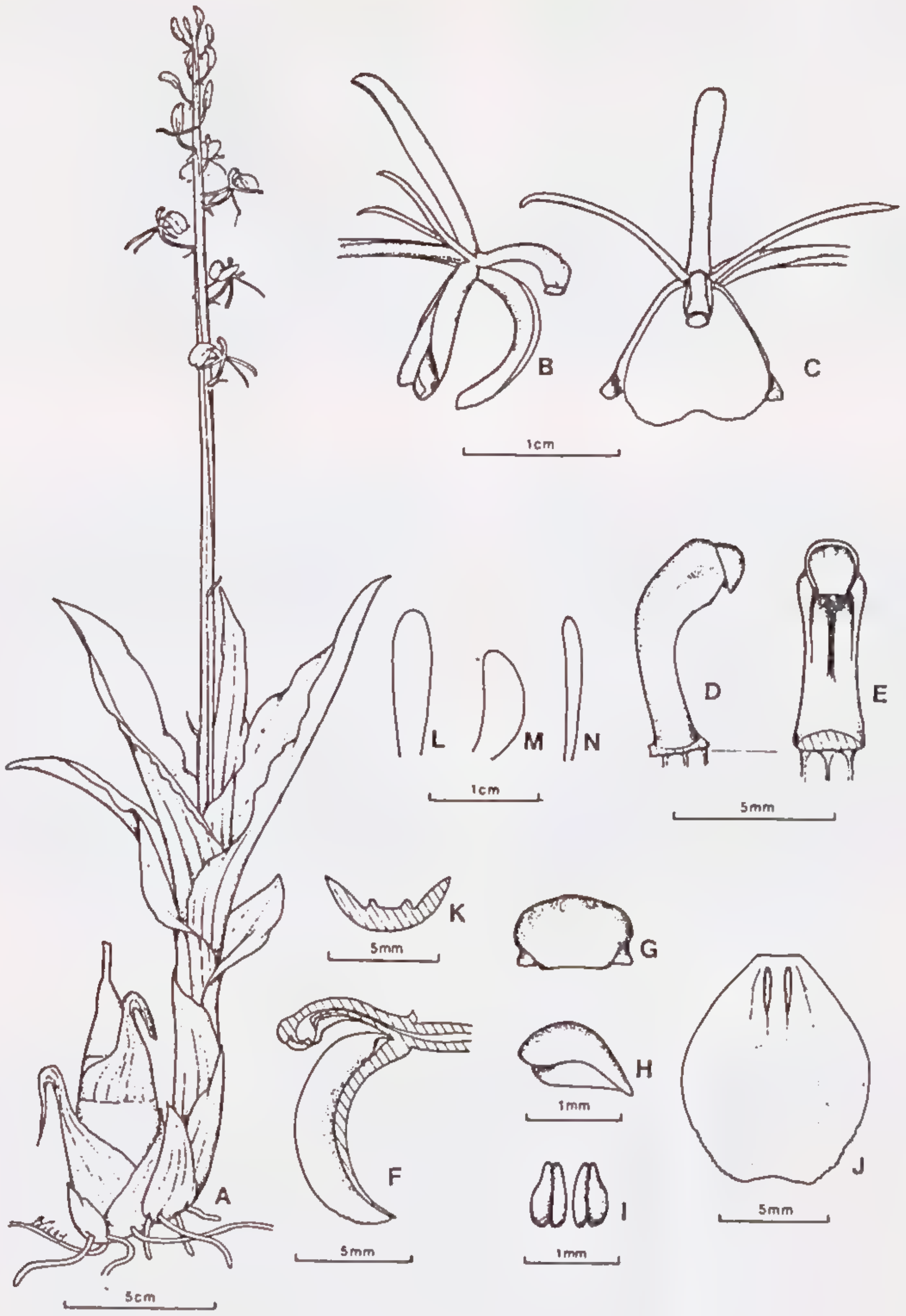
FLOWERING PERIOD

Time of flowering in nature is not known but probably occurs soon after the onset of the wet season. In cultivation flowering occurred from November to January, while the plants were in full growth. Individual flowers last 7–10 days.

NOTES

L. collinsii is most closely related to *L. simmondsii* Bailey but can be readily distinguished from that by its shorter, stouter pseudobulbs and the narrower, lanceolate non-petiolate leaves which are sheathing at the base. The two species have distinct geographic range. *L. simmondsii* has not been recorded north of the Mossman River, which is 350km south of the McIlwraith Range.

The widespread *L. habenarina* (F. Muell.) Benth. which occurs in open forest and grassland situations of north and eastern Australia differs from *L. collinsii* in having



Liparis collinsii

A. Habit.
B. Flower from side.
C. Flower from front.
D. Column from side.
E. Column from front.
F. Section through column and labellum.
G. Anther from front.
H. Anther from side.
I. Pollinia.
J. Labellum flattened.
K. Section through base of labellum.
L. Dorsal sepal flattened.
M. Lateral sepal flattened.
N. Sepal flattened.

All from Gray 5269.

narrower leaves and pseudobulbs which are produced below ground level.

Of the several species in New Guinea, *L. oligantha* Schltr. and *L. finnisterrae* Schltr. appear to be related to *L. collinsii* but are quite distinct.

CONSERVATION STATUS

This species is poorly known and its distribution, even within the McIlwraith Range area is uncertain.

ETYMOLOGY

It gives me great pleasure to name this orchid after the late Rev. R. D. (Ron) Collins of Atherton. Ron had a great interest in orchids, was a good friend and accompanied me on many field trips to Cape York Peninsula.

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SOME NOTES ON *LIPARIS CONDYLOBULBON* REICHB.F.

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In the last issue of *The Orchadian* (Volume 11, Number 7) was Part One of an informative article by Roy Gifford on "Australian *Liparis* Species". Due to his terrific knowledge, I was somewhat surprised that Roy wrote that he hadn't even seen a plant of *L. condylobulbon* (I'm sure you have Roy!) as it is a common plant in the Philippines, where he had imported numerous species over the years. It is easily recognised out of flower and is quite unlike any other Australian member of this genus.

DISTRIBUTION

L. condylobulbon (Plates 7 and 9) was described by Reichenbach in 1862 and has an extensive range in distribution. Being found as an epiphyte or lithophyte from Thailand through Malaysia, Borneo, the Philippines and Taiwan, Indonesia and across to Sulawesi, Ambon, New Guinea and the Pacific Islands before it just reaches a couple of locations in far north Queensland.

This species was discovered in Australia in the late 1970's during an expedition by Alick Dockrill and Geoff Stocker. It has been located at Rocky River, Tozers Gap and a restricted area of the McIlwraith Range, Cape York Peninsula, north Queensland. Alick told me that about 20 plants were found on small trees and rocks in fairly bright locations in gorges and gullies in rainforest at about 500m altitude. Some clones clumped whilst others had a rhizome of up to 2.5cm between the pseudobulbs. It is certainly a rare species in Australia and should be further cultivated and propagated.

DESCRIPTION

For the Australian forms of this species I cannot do better than to quote part of the description from Alick Dockrill's *Australian Indigenous Orchids,* Vol. 1:–

> "This species is quite unlike any other Australian *Liparis*. The pseudobulbs may grow in clumps or spaced apart on rhizomes, are from 4 to 15cm long and bottle-shaped with a long neck and bear two leaves. The leaves are from 5 to 20cm long, from 12 to 22mm broad and taped towards both ends. The inflorescence rarely exceeds the leaves in height and bears numerous small flowers which are greenish cream with an orange labellum. The top sepal and petals are at a right angle to the column although the side sepals are bent

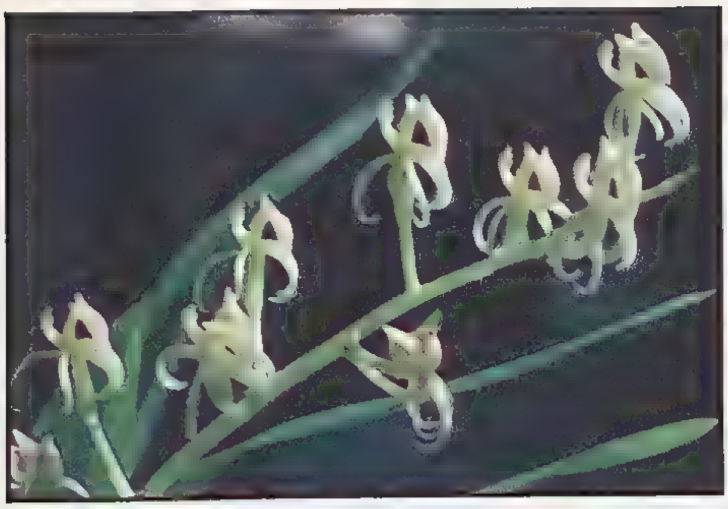

Plate 5: *Liparis nugentiae.* Photo: M. Harrison.

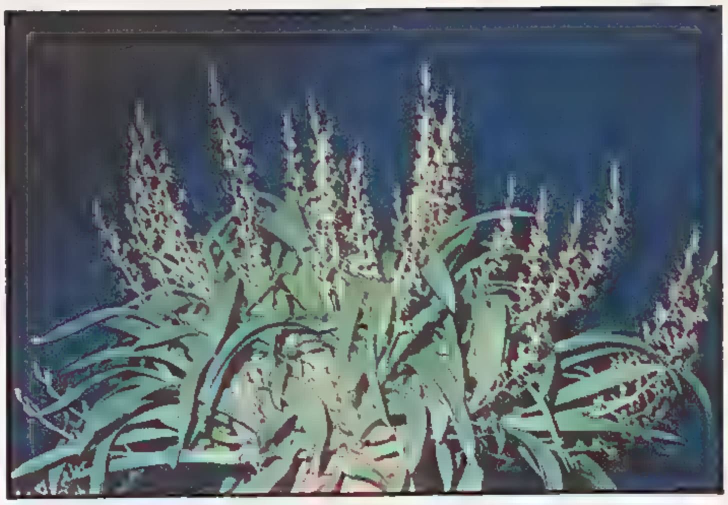

Plate 6: *Liparis swenssonii.* Photo: M. Harrison.

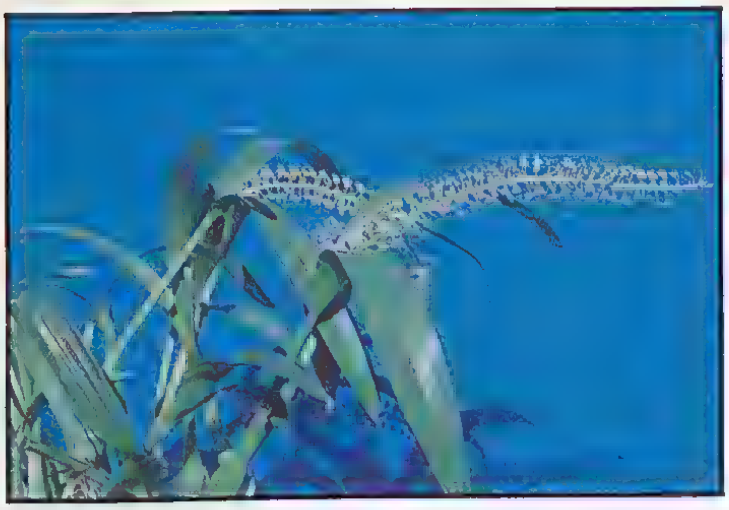

Plate 7: *Liparis condylobulbon* from Philippines. Photo: D. Banks.

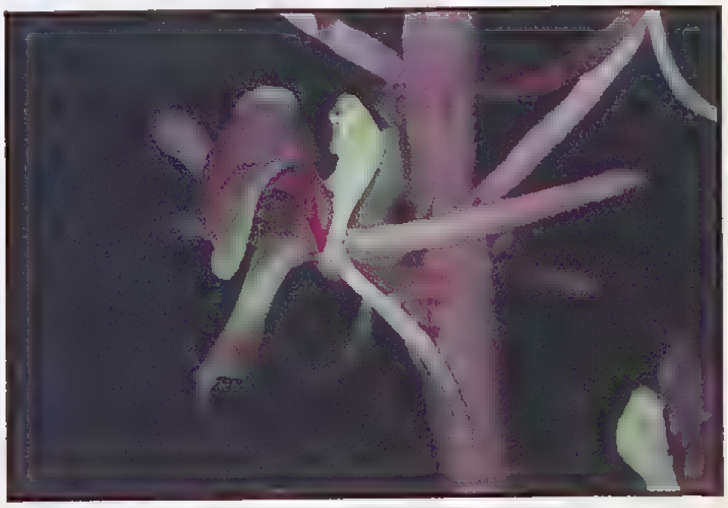

Plate 8: *Liparis* aff. *simmondsii.* Photo: D. Titmuss.

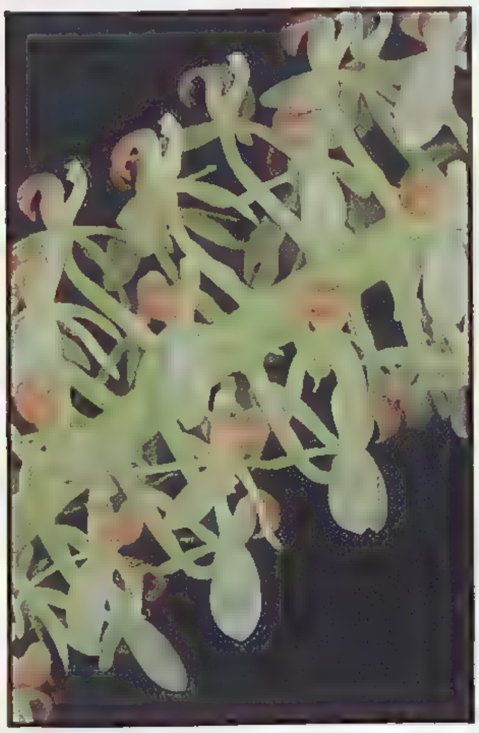

Plate 9: *Liparis condylobulbon* from Philippines. Photo: D. Banks.

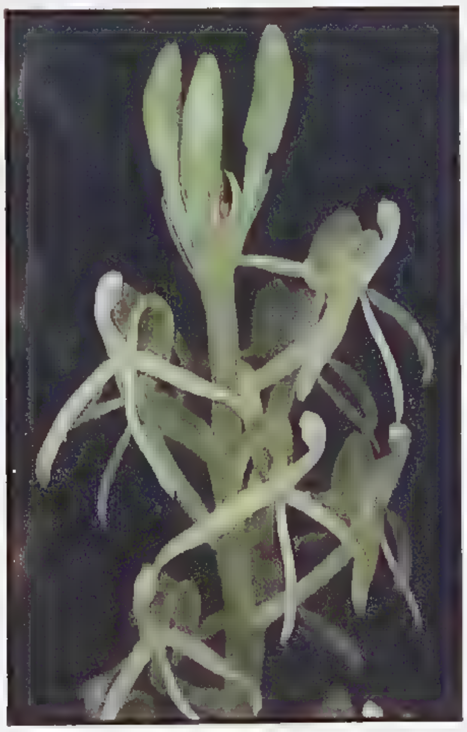

Plate 10: *Liparis swenssonii.* Photo: D. Titmuss.

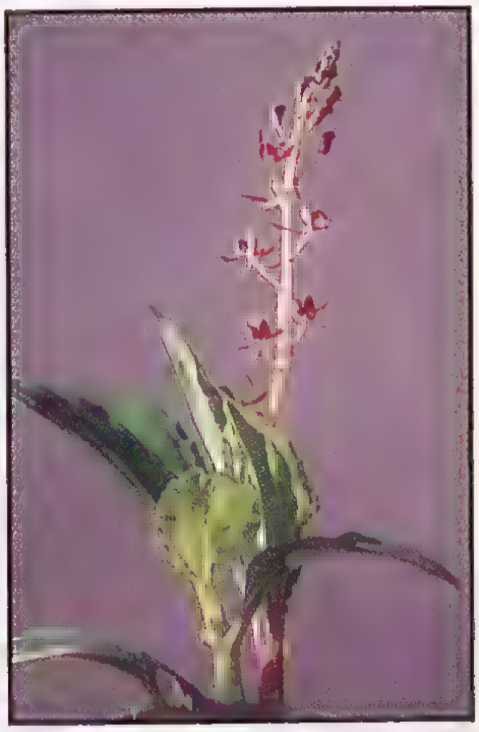

Plate 11: *Liparis* aff. *simmondsii.* Photo: W. Upton.

sharply downwards. The sepals, petals and lip are all about 3mm long, the sepals more or less oval although the petals very narrow. The lip is erect and channelled in the back half then sharply bent downwards, is about 2mm broad and almost oval when flattened out and the front edge has a row of extremely small hairs."

I saw and studied numerous plants of this taxa on my trip to the Philippines in 1991, both at market stalls and in situ.

The main differences between Philippine and Australian Plants are:–

- the size of the plants, as Philippine plants are more robust.
- the rhizome is far longer, up to 10cm long as opposed to up to 2.5cm in north Queensland plants, some Australian clones have pseudobulbs that actually clump together.
- Philippine clones have much longer inflorescences with up to 70 flowers.
- Australian clones require more heat to flower satisfactorily.
- the Australian clones have been found at an altitude of around 500m, whilst in the Philippines it can be found from around sea level to 1,500m.
- however, flower colour is almost indistinguishable.

CULTIVATION

L. condylobulbon is an easy orchid to cultivate if given a winter minimum temperature of 10°C, it does not mind high temperatures during summer. My plants are growing well in squat plastic "Port" pots in a mixture of 75% medium grade treated pine bark (from Orchid Care Services, N.S.W.), 20% washed river gravel and 5% perlite. Some growers use tree fern (as they do in the Philippines) however it is more difficult to give the plants constant moisture during their growing period.

My plants are grown in a glasshouse under 50% shade and are kept well watered throughout the year until winter when the plant enters a dormant phase. Little water is given during this time.

The Philippine clones flower freely at odd times throughout the year as I have had flowers in May, September and February. I and other growers have had trouble flowering the Australian clone. Erik Leilkajis flowered his plant (of the same clone) very well in winter 1994, having given it good light and a minimum temperature of around 20°C. This could be the key to flowering it well outside of the tropics.

Plants can be repotted during the warmer months of the year. Divisions of three or four pseudobulbs can be taken off in spring and will respond quite well.

ACKNOWLEDGEMENTS

Thank you to Jim Cootes for being my guide during our 1991 trip to the Philippines and for providing me with most of my Philippine material and to Darryl Smedley who kindly gave me a division from one of the original Australian collections. Special thanks to Alick Dockrill and Michael Harrison for further information on this species and to David Titmuss for help with photography.

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SHOW DATES

A.N.O.S. Warringah Group Inc.
21st Annual Spring Show at Forestville Memorial Hall, Starkey Street, Forestville. 8th to 10th September, 1995.

A.N.O.S. Port Hacking Group
Spring Show 10th September, 1995.
Sarcochilus Show 29th October, 1995 both at Scout Hall, Oliver Street, Heathcote, 10.00 a.m. to 5.00 p.m.

A.N.O.S. Mid North Coast Group
Sarcochilus display and sale at Manning Mall, Taree on 13th and 14th October, 1995.

A.N.O.S. Geelong Group Inc.
Annual show at the Masonic Hall, Gheringhap Street, Geelong on 4th and 5th November, 1995.

SOME NEW VIRUSES IN OUR NATIVE ORCHIDS

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Two viruses common in other orchid genera have been detected in Australian native dendrobiums.

A flexuous rod-shaped particle (Plate 18) has been detected in *Dendrobium kingianum.* The symptoms are colourbreak in the flowers (Plate 12), yellow markings turning black with age in the leaves (Plate 15). This appears to be a very fast moving virus and could be transmitted very easily by cutting tools, plants rubbing against each other, insects or by handling plants.

TREATMENT

If the infected plant is of value to you, get it tested and, if positive, destroy by burning in the incinerator. If just a nice plant, destroy by burning. Do NOT dump it as someone may pick it up and take it home, thus spreading the problem.

There are, of course, normal colour patterns in blooms created by nature and the hybridist (Plate13) and enhanced pigmentation in leaves (Plate 23) caused by strong light and/or fertiliser. Other markings such as those in *D. speciosum* var. *pedunculatum* 'Royal Purple' (Plate 14) that have been suggested as being caused by virus, have so far, after being tested three times over 18 months, tested negative to any known virus. In the future, a programme of innoculating virus free plants with sap from red-spotted clones will commence. If these virus free clones show red-spotting we will then have something positive to work with.

Rhabdovirus has also been detected in our Australian native dendrobes showing as black spotting surrounded by yellow tissue (Plates 16 and 17). The difference between Rhabdovirus and fungal spotting (Plate 19) is the circular arrangement of the spots and the presence of chlorosis in the virus-infected plants.

TREATMENT

As this is a slow moving virus, it may be possible to backcut the infected plant and get a virus free piece. However, get the division tested a couple of times and watch for virus signs. Destroy infected plants by burning.

Some other hazards of growing native orchids can be seen in (plate 20), the Orchid Beetle (*Stethopachys formosa*), (Plate 21), bacterial rot and (Plate 22), the Two-Spotted Mite (*Tetranychus urticae*).

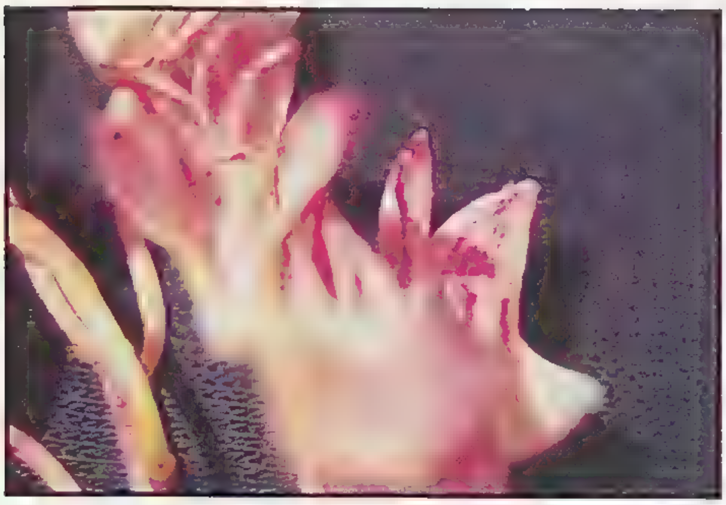

Plate 12: *Dendrobium kingianum* infected with Cymv strain.

Plate 13: *Dendrobium* Pompadour. Normal splash petal — no virus.

Plate 14: *Dendrobium speciosum* var. *pedunculatum* 'Royal Purple' tested 3 times — no known virus found.

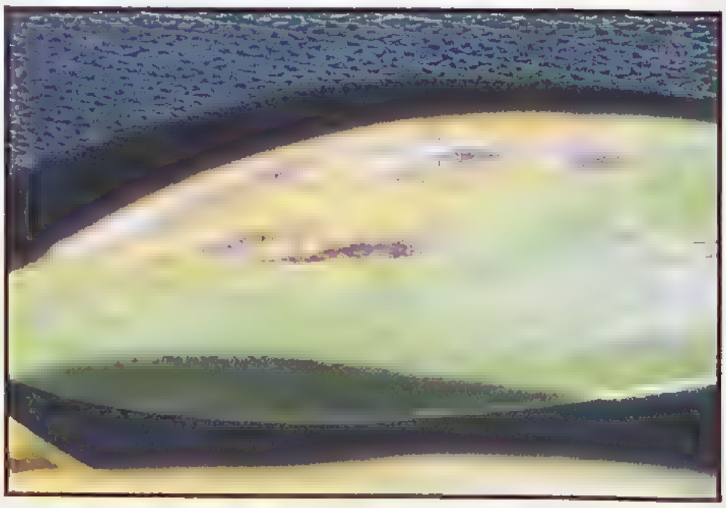

Plate 15: *Dendrobium kingianum* infected with Cymv strain.

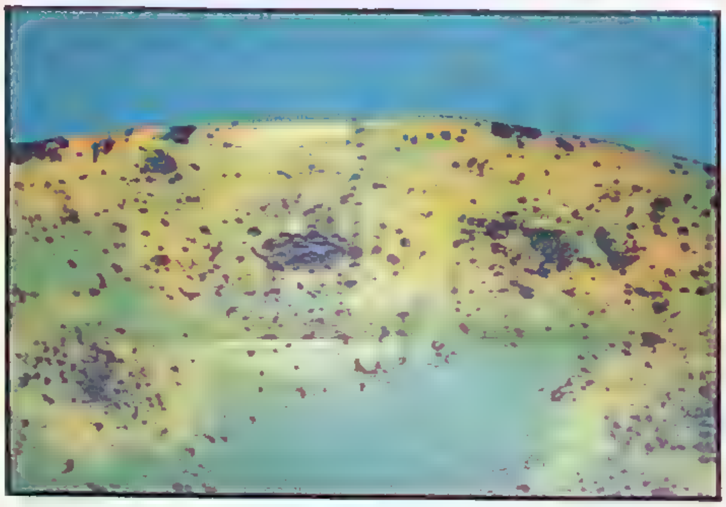

Plate 16: Native *Dendrobium* with Rhabdovirus.

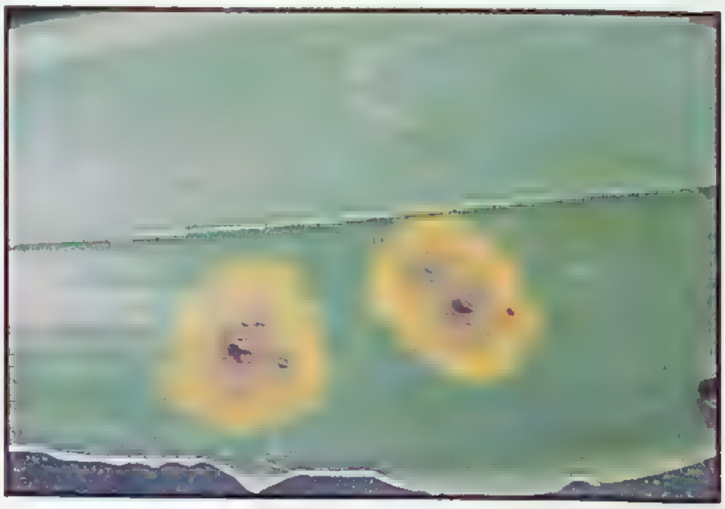

Plate 17: *Dendrobium speciosum* infected with Rhabdovirus.

Photos: Plates 1, 4, 6 and 7, D. Gowanlock. Plate 3, D. Banks.

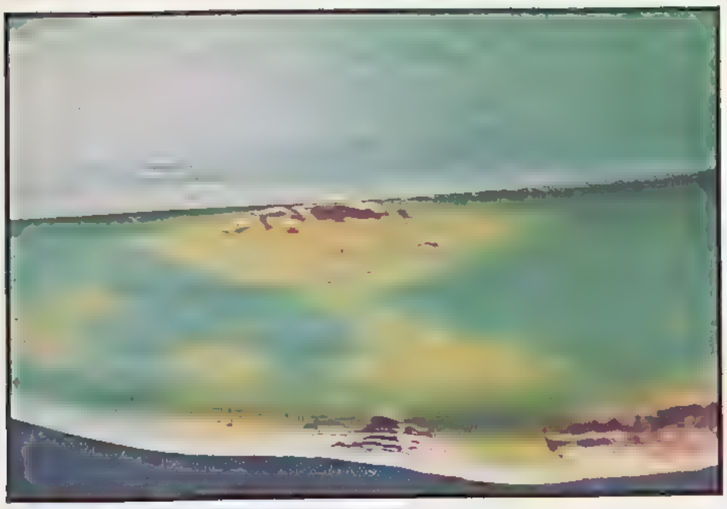

Plate 18: *Cymbidium madidum* infected with Rhabdovirus.

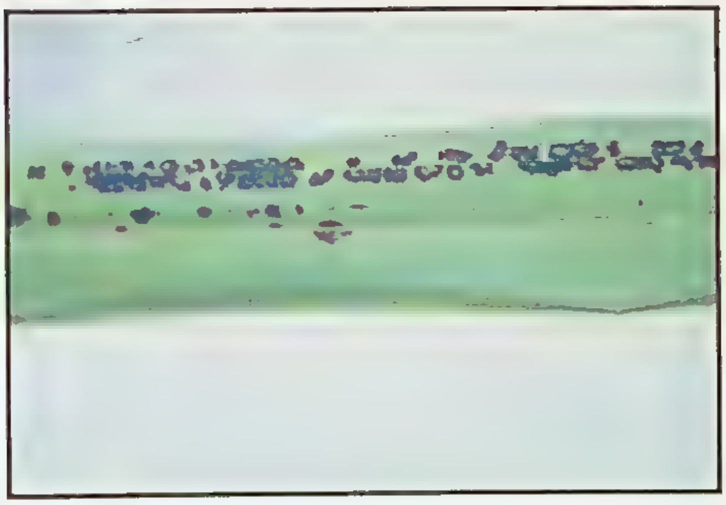

Plate 19: Fungal spotting on *Cymbidium*.

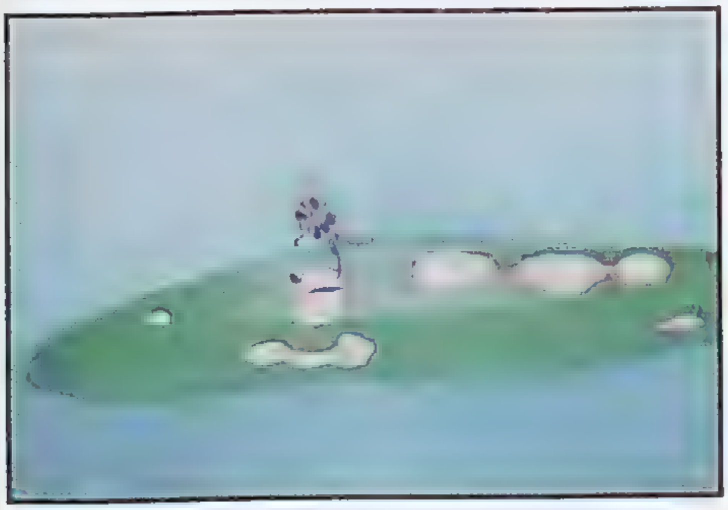

Plate 20: Orchid Beetle and damage.

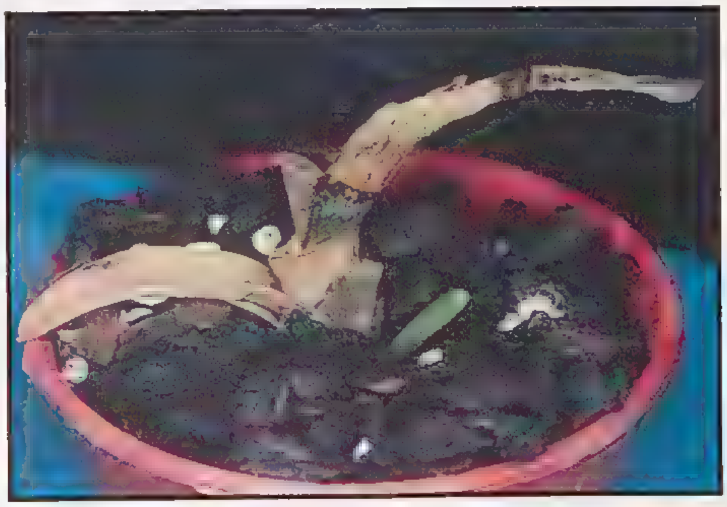

Plate 21: Bacterial rot in *Sarcochilus*.

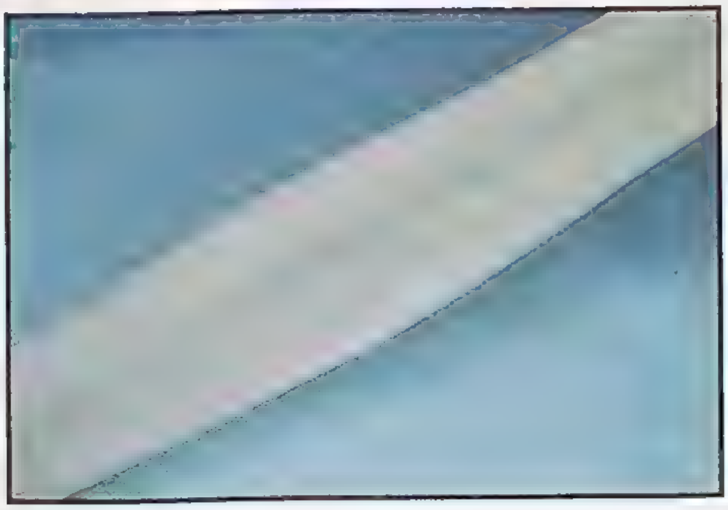

Plate 22: Two Spotted Mites.

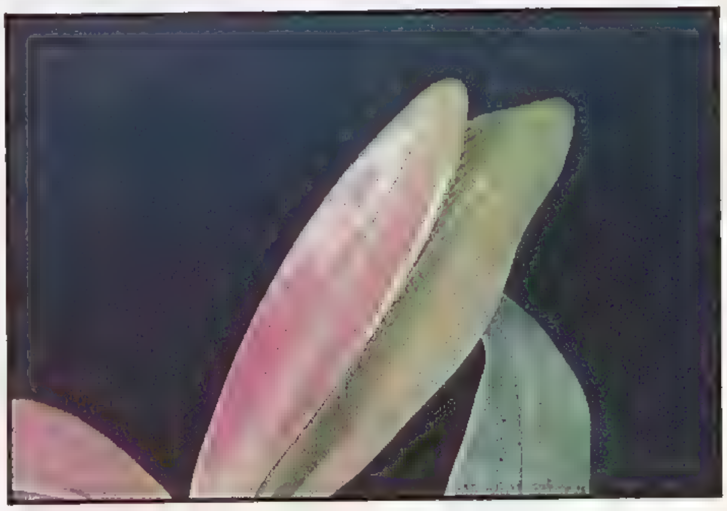

Plate 23: Pigmentation from strong light on *Dendrobium kingianum*.

Photos: Plates 2, 5, 8–12, J. T. Woolf.

CULTIVATION OF SOME MINIATURE NEW GUINEA SPECIES

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Success in orchids is relative. Sometimes the goal can be to achieve an outstanding flowering on a large and easily cultivated plant. Other times it could just be to ensure survival of some small miserable piece of an otherwise desirable clone. Most times it would be to grow and flower a plant to its maximum potential under your conditions over a number of seasons. In the case of New Guinea orchids, I would add the desire to discover something about the cultural requirements of the species. This is more so when the species are miniature and have not had the horticultural attention over the years of the large and showy ones.

I have grown a few miniature New Guinea species to the point where I could claim some small success. I am still experimenting with others to find something about their cultural requirements. Habitat information on these species is meagre and hard to find and cultural information is not much better. I hope that the following notes raises the level of cultural knowledge just that little bit.

Cadetia chionantha (Plate 24)

I obtained my piece of this species as a small division in 1988. It is a diminutive species, a mature plant is only 5cm high. The pseudobulb and leaf are quite thin. The flowers arise from the axis of the pseudobulb on a pedicel about 15mm long. The 8mm flower is a beautiful crystalline white, triangular in outline with broad lateral sepals for the genus and with a fleshy and prominent labellum. It carries a few flowers for most of the year with the peak display in spring.

The division was potted into a 50mm plastic thumb pot in seedling bark. I surmised that, as the root system was fairly short and thin, a media that was reasonably moisture retentive would suit. The plant had no difficulty in establishing and is still content in its original pot.

The condition of the media is checked each spring to see if it is still serviceable. As it now has a decent root mass it is simple to ease it out, inspect the media and drop it back into the pot. If you intend to keep a plant in the same media for some years it is important that this task is performed routinely to ensure that the media won't go "off" until next repotting time.

I make sure that the specimen is watered regularly, every 2–3 days at a minimum. It is at the back of the glasshouse in the cooler, more shaded portion where the direct light it receives is minimal. Air movement is not extravagant. The rush from the fan at the front has mostly dissipated by the time the breeze reaches it. The glasshouse is maintained at a minimum of 13° in winter. The relative humidity is assessed by that wonderfully subjective technique of smelling the air. A glasshouse humming along with all elements in balance has that evocative tropical forest smell to it. If something is out of whack, usually humidity, especially in winter, it gets a dry raspy smell about it.

This *C. chionantha* originated from Gerald McCraith in Melbourne who collected it some years ago from a road cutting near Ambua at about 3,000m in the Southern Highlands of Papua New Guinea. I would guess then, that the species would tolerate temperatures lower than 13°.

Mediocalcar decoratum (Plates 30 and 34)

This species is mat-forming and quite vigorous. One clone is established on a raft of thick, fibrous tree fern and the other on a slab of ironbark bark. The first does a little better, no doubt because its substrata holds that little bit more water than the ironbark. I have also seen it grown very successfully in large flat terracotta saucers in a seedling type mix. The roots are thin and quite wiry, almost stilt-like. The leaves are succulent and show a slight shrivelling if the water is not kept up to them.

The great thing about this species is that it thrives in cooler temperatures. My plants are in the shadehouse all year and are hung with our cool temperate bulbophyllums. Growth actually ceases in summer and reactivates in early autumn.

Flowering occurs from late autumn into winter. They are like little orange and yellow exploding balls, the yellow petals and sepals seeming to burst out from the side of a tiny orange. Each flower is about 6mm in diameter. A well cultivated exhibit will carry dozens of flowers all over the plant, like driblets of colour in a dark green sea.

Mediocalcar bifolium (Plates 27 and 29)

This species is not as vigorous as the previous species, seeming to grow in loose strands rather than a crowded mat. However, it is just as cold tolerant, slows down at the height of summer and comes into flower in late autumn.

The flowers are slightly larger than the previous species. The bulbous part of the flower is scarlet and the petals and sepals are a delicate pink, almost white, like a piece of exploding bubblegum.

I have two clones of this species. One is in an 80mm pot with bark and pebble of about 8mm diameter. The other is in a 100mm "Port Pot" filled with seedling grade *Sequoia* bark. The latter grows and flowers a little better. I tried the combination of a large pot filled with small bark to increase the amount of water available to the plant and to increase the humidity in its immediate environment in hot weather. Whether this is a better technique than a large slab of tree fern I don't know. I'll have to wait until I have more material as this species is not all that vigorous.

Dendrobium cyanocentrum (Plate 25)

This species is a little tufted epiphyte from the section *Oxyglossum*. It has pale pinkish flowers suffused with purple or blue, arising from almost grass-like pseudobulbs and leaves.

In October, 1993, I deflasked seedlings into a tray of 50mm tubes. Half got a mixture of equal parts seedling bark, pebble, milled-up tree fern fibre and perlite, the other seedling bark and pebble on a 4:1 ratio. Both types produced well grown plants so I won't bother to go to the trouble of concocting a special brew again. However, if you don't try you don't find out.

Most of the seedlings flowered the following autumn. Here's where I made my mistake — I left them outside over winter. Come spring, some of the plants looked very crook. This disturbed me as I thought they were reasonably high altitude plants and should have been more cold tolerant. Over then to the literature. Reeve and Woods (1989) give the altitude range as 100–1,300m. I then asked Phil Spence, from whom I had obtained the flasks, about the source of my *D. cyanocentrum*. Of course they came from the lower part of the range not far from Port Moresby.

They can therefore come outside for the summer but they will now be overwintered in the glasshouse where they can receive good, but filtered light and that essential winter warmth.

Dendrobium bulbophylloides (Plates 26 and 28)

This is a small creeping epiphyte where the small glossy and succulent pseudobulbs and leaves resemble, naturally enough in view of the name, a *Bulbophyllum*.

I have two clones, a division courtesy of Fred Fetherston and a seedling from the nursery of Geoff Stocker. When Fred gave me a small division of his piece in 1990, his advice was to mount it on tree fern and always keep it saturated.

It was so mounted and has slowly crept along on its host. Because an effort is made to always keep the mount moist, algae and moss have developed on this totem more than on some others.

The leaves have taken on a palish hue so I expect that it is suffering from a degree of nitrogen deficiency induced by the growth of the other material on the host.

It produces its small flowers in the spring and into the summer. The flowers are about 1cm across, orange spotted with maroon with a darker purple labellum. The whole flower is very shiny and lasts about three weeks.

The seedling I obtained in 1989 has grown vigorously and is now 15cm in diameter. The wretched thing has not yet flowered. Both clones aren't too far apart in the glasshouse so there must be some other factor inhibiting flowering in the seedling. It's well known in horticultural circles that cuttings of mature plants can flower much earlier than seedlings. I guess this applies to *D. bulbophylloides* as well.

Reeve (1983) indicates that the *Microphytanthe* section of *Dendrobium* usually grow on the trunks and large branches of trees in semi-open forest. The altitudinal range of *D. bulbophylloides* is given as 1,000–2,750m. In my glasshouse they are in the more shaded end as this is also the coolest. The seedling has grown vigorously in this location so its probable that a position providing only light shade would be optimum to induce flowering.

I hope that these notes assist growers with their cultivation of some of the smaller Australasian species. They are worthwhile subjects and create that added bit of interest in the collection and on the showbench. They can also be champions! The *Cadetia chionantha* was Champion Other Species at the A.N.O.S. Conference at Wollongong in 1990 and one *Mediocalcar decoratum* was Reserve Champion at the orchid Glenn Nursery Show at Dungog in 1993.

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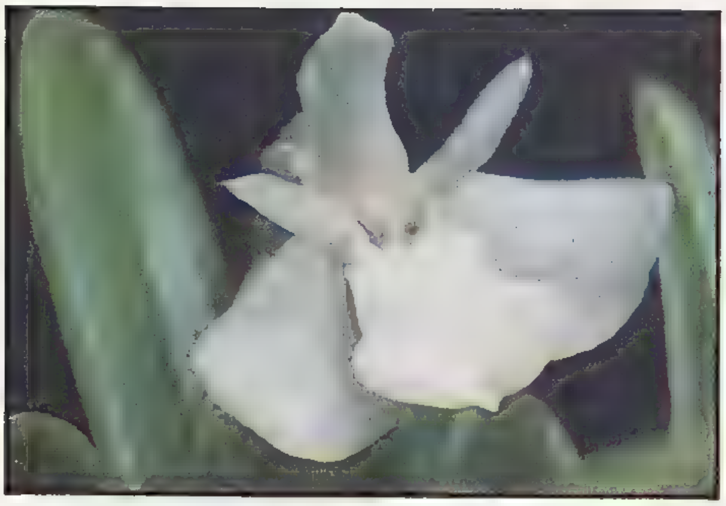

Plate 24: *Cadetia chionantha.* Photo: D. Titmuss.

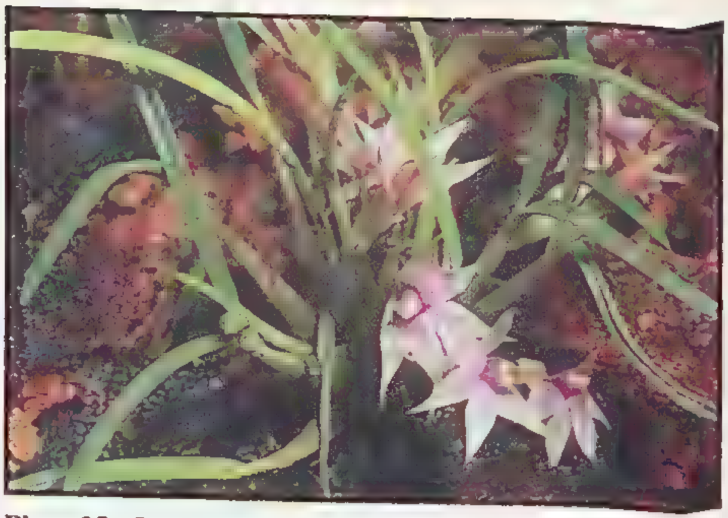

Plate 25: *Dendrobium cyanocentrum.* Photo: D. Titmuss.

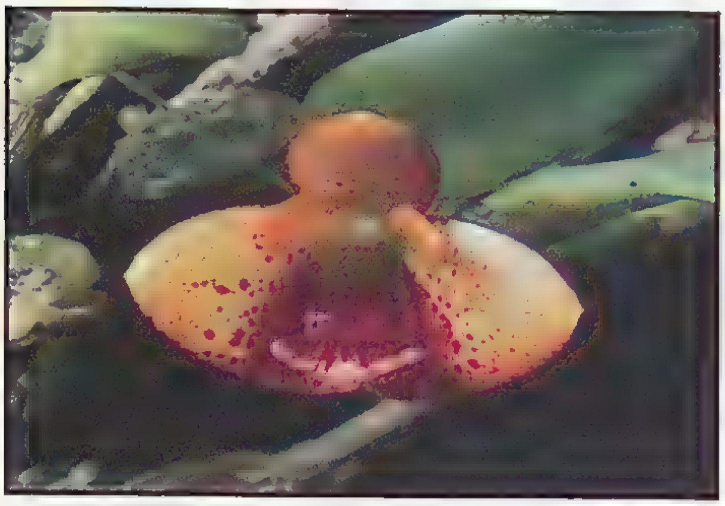

Plate 26: *Dendrobium bulbophylloides.* Photo: D. Titmuss.

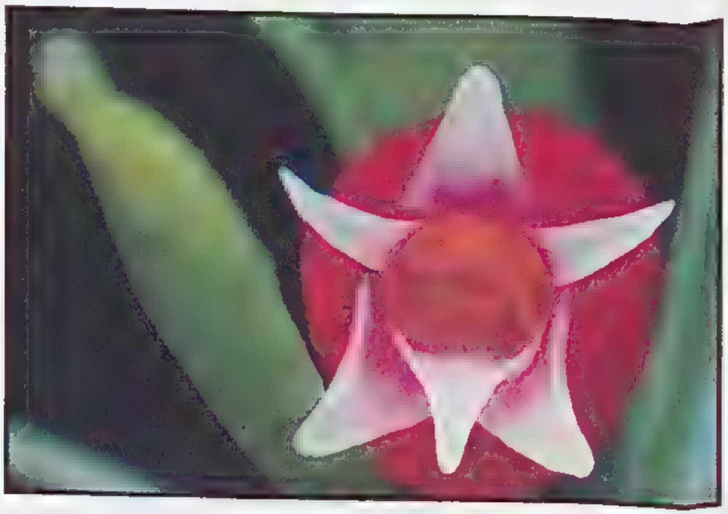

Plate 27: *Mediocalcar bifolium.* Photo: D. Titmuss.

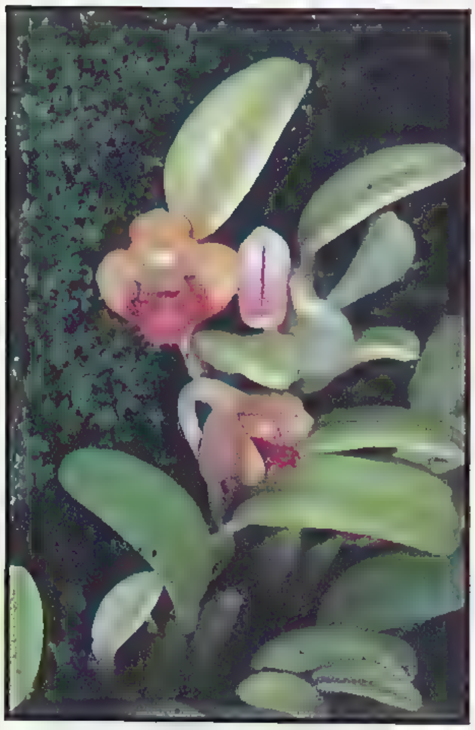

Plate 28: *Dendrobium bulbophylloides.* Photo: D. Banks.

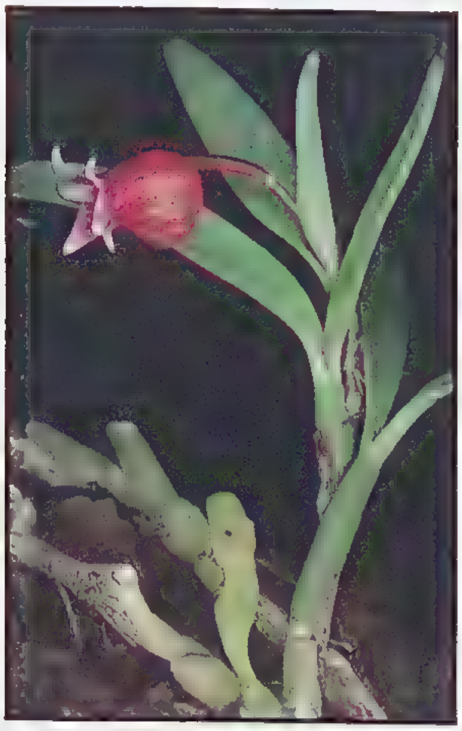

Plate 29: *Mediocalcar bifolium.* Photo: D. Banks.

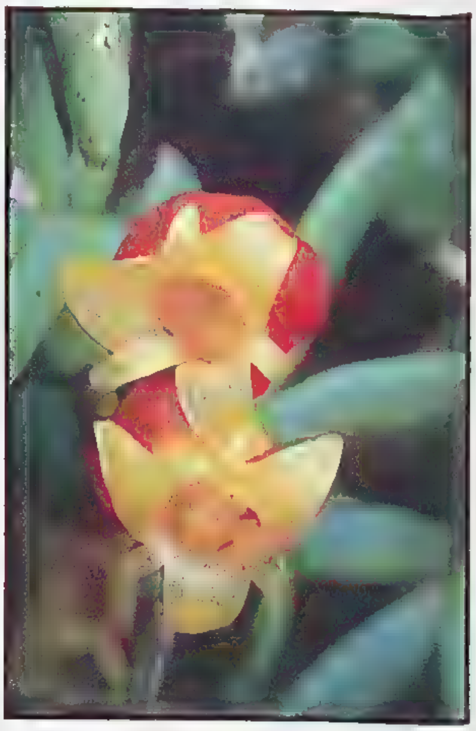

Plate 30: *Mediocalcar decoratum.* Photo: D. Titmuss.

POLLINATION AND BREEDING SYSTEMS IN VARIETIES OF *DENDROBIUM CANALICULATUM* AND THEIR IMPLICATIONS ON THE TAXONOMIC STATUS OF THE GROUP

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SUMMARY

The pollination and breeding system in varieties of *Dendrobium canaliculatum* were examined in the field and in private collections. The flowers are nectarless and attract pollinators with a variable colour display and fragrance. *Hylaeus chromaticus* and *H. ruficeps* removed pollinia and pollinated flowers of *Dendrobium canaliculatum* var. *canaliculatum* and *D. canaliculatum* var. *nigrescens*. Experimental pollinations indicate that these varieties are self-fertile and out-breeding. I speculate that multiple pollinators and outbreeding may have influenced the floral variation in *D. canaliculatum*.

INTRODUCTION

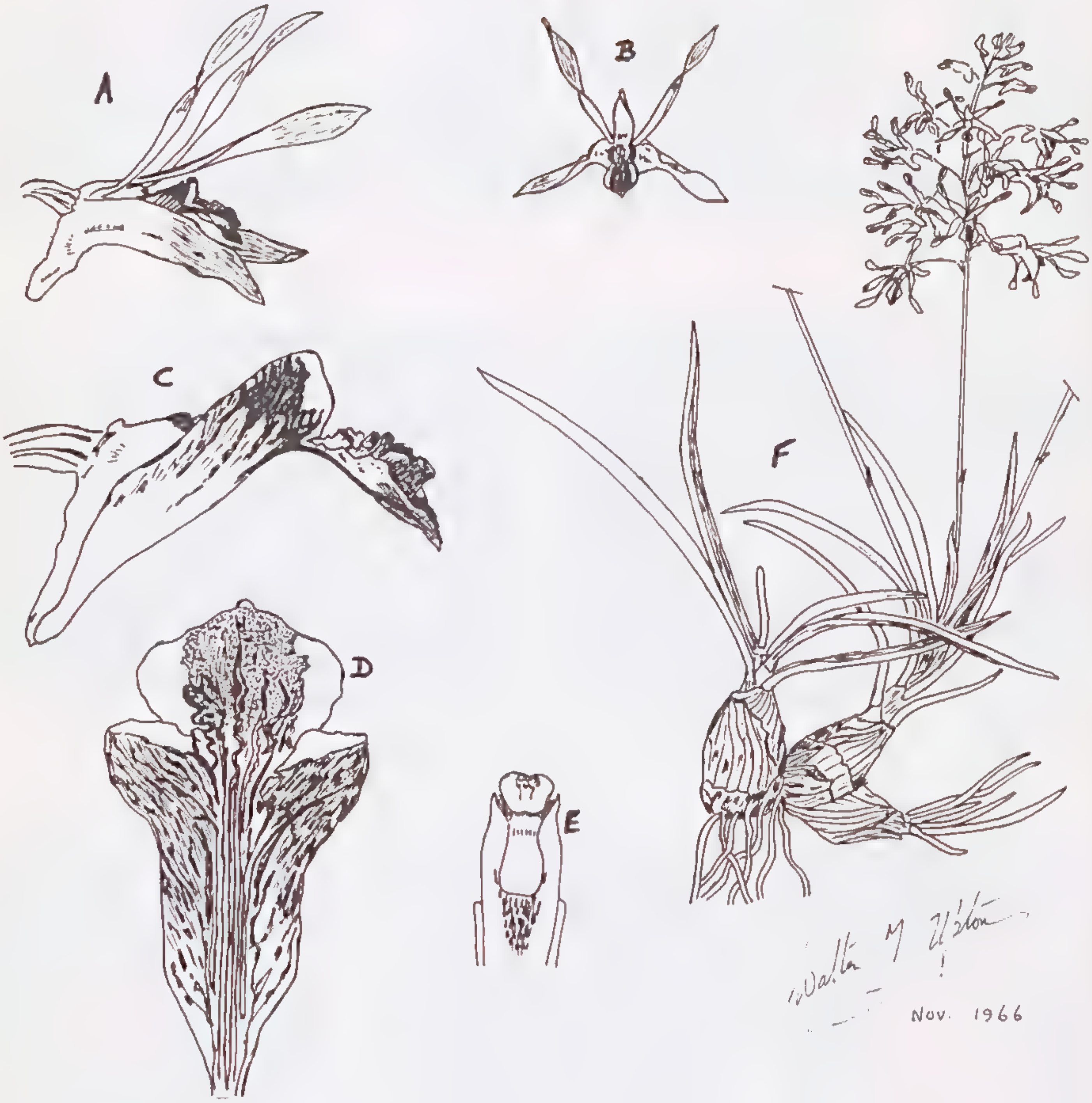
The "Tea-Tree" orchid of northern Australia, *D. canaliculatum* R.Br., is a widespread species which includes a number of recognised varieties (Dockrill 1969, 1992, Jones 1988, Upton 1989). Of these, *D. canaliculatum* var. *canaliculatum* is sympatric with *D. canaliculatum* var. *nigrescens* Nich. throughout its distribution, while variety *foelschei* (F. Muell.) Rupp and T. E. Hunt is geographically isolated from the others (Dockrill 1969, 1992, Jones 1988). In the Catalogue of Australian Orchidaceae, Clements (1989) proposed changes to the previously accepted status of varieties in *D. canaliculatum*. The taxonomic changes by Clements (1989), however, has resulted in considerable confusion as to the character states used to define a number of native orchid species (Upton 1989, Adams 1991, Lavarack 1991).

In plants, specific gene pools are maintained with genetic isolation. Isolation may occur either before or after pollination (Levin 1978). *D. canaliculatum* var. *canaliculatum* and *D. canaliculatum* var. *nigrescens* co-occur, present similar floral displays and have overlapping flowering periods (Dockrill 1969, 1992, Jones 1988). Evidence for speciation in these varieties is based on subjective observations of variable flower colour. Lacking are data on the pollination and breeding systems in varieties linking reproductive isolation to a pre- or post-pollination mechanism. The expected result of speciation is that reproductive isolation between varieties is guaranteed by pollinator specificity or incompatible breeding systems. To date, there have been no previous studies to test and confirm this hypothesis for this group of plants.

The aim of this study was to investigate the pollination and breeding systems in *D. canaliculatum* var. *canaliculatum* and *D. canaliculatum* var. *nigrescens*. Three questions were asked for each variety: (1) What is the pollinator?; (2); What is the pollination system?; and, (3) What is the nature of the breeding system?

METHODS

This study was conducted between July, 1990 and November, 1992 in north-east Queensland. Pollinators of *D. canaliculatum* var. *canaliculatum* and *D. canaliculatum* var. *nigrescens* were investigated by directly observing an insect visitors path of movement between flowering plants at four sites. In 1990 and 1991, 19 accessible plants of var. *canaliculatum* were observed *in situ* at Sunday Creek, about 30km south-east of Cardwell (18° 16'S, 146° 02'E). Seventeen plants of var.



Dendrobium canaliculatum R.Br.

Collected at Tully, north Queensland in 1959 by R. Miller

A. Flower, side view	2X
B. Flower, front view	1X
C. Column & labellum, side view	4X
D. Labellum, pressed flat	4X
E. Column, front view	4X
F. Plant	⅓rdX

canaliculatum and eight of var. *nigrescens* were cultivated on natural branches in a Herberton (17° 23'S, 145° 23'E) garden. In 1990, 1991 and 1992 two to five flowering plants of each variety from the Herberton garden, were taken to an area near the Walsh River for observations. The site was about 6km north-west of Herberton, where plants of var. *canaliculatum* naturally occur. Plants were attached to tree trunks two metres above the ground and about one metre apart. In 1990 and 1991, observations of each variety were made in a private collection at James Cook University of North Queensland, Townsville (19° 00'S, 147° 00'E). Grundon (1992) provides a detailed description of this collection. Observations of pollinators were made at various times of the day, during most climatic conditions. Pollinators were observed whenever possible and captured with an aspirator for identification.

To investigate the breeding systems, five plants of var. *canaliculatum* and six of var. *nigrescens* were collected from different areas throughout their range. Variety *canaliculatum*, was collected from Silver Valley, Walsh River, Hinchinbrook Island, Cardwell and Christmas Creek, while var. *nigrescens* was collected from Portland Roads, Archer River, McIlwraith Range, Musgrave and Luster Creek. These plants were cultivated on natural branches in a shadehouse at Herberton and were given three experimental pollination treatments as follows: cross-pollination within variety, cross-pollination between variety and self-pollination. Two flowers per plant were treated in each manner resulting in six pollinations per plant. Plants were covered with nylon netting to exclude pollinators. Capsules were assessed at the time of dehiscence. Capsules producing seed with embryos were deemed viable. Chi-square analyses were used to investigate whether the relative frequencies of successful capsule production were independent of pollination treatments and varieties. The size of all shoots per plant was measured (from the rhizome to the attachment of the first leaf), at the time of flowering. Spearman's correlation was used to investigate the association between capsule production, inflorescence size and mean shoot size.

RESULTS

Pollinators

Observations of plants in both the field and cultivated collections have shown that butterflies, syrpid flies, introduced honeybees and native bees from the genus *Hylaeus* visited the open flowers of each variety. Syrpid flies and butterflies were the most frequent visitors, but none came into close contact with the pollinia or stigma and pollinated flowers. Only a small proportion of the insects observed visiting flowers actually removed pollinia and pollinated flowers. The bees *H. chromaticus*

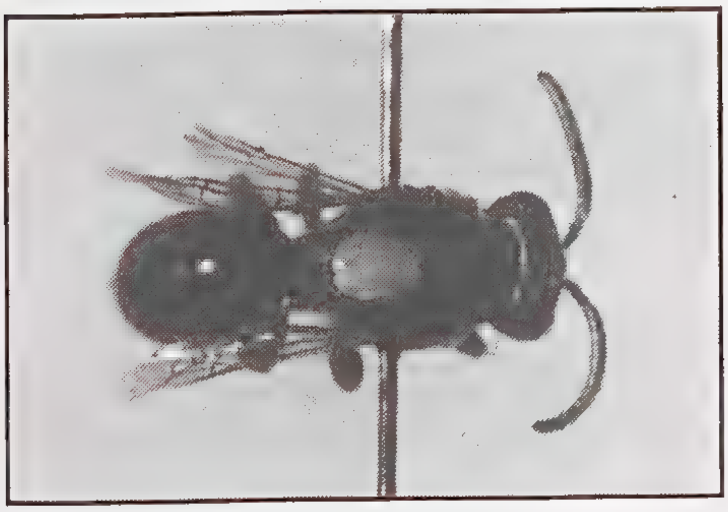


Plate 31: *Hylaeus* bee with pollinia.

Plate 32: *Hylaeus* bee with pollinia.

and *H. ruficeps* were the only insects seen to pollinate the flowers of *Dendrobium canaliculatum* var. *canaliculatum* and *D. canaliculatum* var. *nigrescens* during this study (Table 1). These *Hylaeus* bees visited two or three flowers per plant and there was no evidence that pollinators discriminate between plants of var. *canaliculatum* and var. *nigrescens* when growing together in the field or under cultivation. Pollinator activity was confined to between 10.00 a.m. and 3.00 p.m., when the temperature was above 25°C.

Pollination system

The flowers of var. *canaliculatum* and *D. canaliculatum* var. *nigrescens* do not produce nectar but have a strong musk-like fragrance. The fragrance intensifies during the day and no perceptible odour is detected at night. To the human nose, the scent of each variety appears identical. Pollinators were observed when the flowers were fragrant.

Hylaeus bees visit the open flowers by a hovering behaviour and land on the petals and sepals. The bee then appear to chew and scratch at the calli on the labellum and slowly crawls into a flower. They spend about five to 10 minutes in a flower and periodically move backwards and forwards near the base of the labellum. The labellum holds the insect firmly against the column as its scutum protrudes into the sticky stigma surface. As the bee reverses out of a flower, the anther pivots on its filament to allow the pollinia to be deposited on the insect's scutum where viscous stigmatic fluids are smeared (Plate 31 and 32). Pollination occurs in a similar manner when the pollinia is deposited on the stigma of the second flower visited.

The pollinia of each variety incorporate two compressed pairs, without a caudicle, stipe or viscidium. The pollinia are slightly curved on the lower surface and spathulate when viewed from the side. In all cases examined, the flowers of different varieties were of similar size and the pollinia were attached to the same position on a pollinator.

Breeding system

About 50 to 60% of artificially pollinated flowers of *Dendrobium canaliculatum* var. *canaliculatum* and *D. canaliculatum* var. *nigrescens* produced capsules and was independent of variety ($x_1^2 = 0.32$, P (Yates) = 0.57). Successful pollination of flowers is followed by yellowing of the perianth parts and their closure around the column within five days of pollination. Some capsules were produced from each artificial pollination treatment of *D. canaliculatum* (Table 2). A significant number of self-pollinations aborted prior to maturity within each variety (var. *canaliculatum*, $x_2^2 = 8.67$, $P = 0.013$; var. *nigrescens*, $x_2^2 = 10.83$, $P = 0.004$). Capsule production was significantly correlated with inflorescence size ($r_s = 0.75$, $n = 11$, $P < 0.01$) and shoot size ($r_s = 0.82$, $n = 11$, $P < 0.01$).

DISCUSSION

Within the Australian species of *Dendrobium* there is a diversity of floral forms, but native bees appear to be the chief pollinators. Previous studies have found that bees from the genera *Euryglossina* (Jones 1974), *Homalictus* (Jones and Gray 1977, Slater and Calder 1988) and *Trigona* (Smythe 1970, Jones and Gray 1976, Adams *et al.* 1992, Bartareau 1993a,b, 1994) pollinate a number of endemic species. In this study, two species of *Hylaeus* were found to pollinate the flowers of *D. canaliculatum* var. *canaliculatum* and *D. canaliculatum* var. *nigrescens*. These results corroborate the observations by Gray (cited in Jones 1983) that *Hylaeus* bees are pollinators of *D. canaliculatum*. The evidence suggests that pollinators have co-adapted to fragrance as the main attractant and not flower colour.

Colourful, fragrant, nectarless and zygomorphic flowers are typical of orchids usually associated with pollination by bees (van der Pijl and Dodson 1966). Ackerman (1986) suggests that the efficiency of a nectarless pollination systems in orchids may be dependent on the learned behaviour or naiveté of a pollinator. Hence, variation in flower colour may reduce a pollinator's chance of learning and avoiding nectarless flowers (Little 1983, Ackerman 1986). The large range of colour variation in varieties of *D. canaliculatum* support this general hypothesis. With more detailed information on the pollination of *D. canaliculatum* varieties by *Hylaeus* bees and an understanding of its basis, we will be better able to form a hypothesis on the evolution of the relationships between the bees and these plants.

Although plant size was a significant determinant of capsule production, the results of experimental self- and cross-pollinations indicate some self-incompatibility in plants of varieties *canaliculatum* and *nigrescens*. Johansen (1990) found that the wet detached cell stigma described by Calder and Slater (1985) of *Dendrobium* species discriminate between the auxin content of pollinia to govern self-incompatibility. The cross-pollinations both within and between varieties had a greater success than did self-pollinations. At present very little can be said conclusively about seed numbers and seed viability in capsules from self- and cross-pollinations. Perhaps outbreeding increases reproductive fitness. Outbreeding in turn would contribute to the range of floral variation observed in *D. canaliculatum*.

Many species of *Dendrobium* appear to be self-incompatible (Adams 1988, Johansen 1990, Bartareau 1993a), but many can be artificially crossed (see hybrid lists). The putative natural hybrid *D. canaliculatum* X *D. johannis* Reichb.f. occurs in localities where both parents occur (Dockrill 1992). Hence, prepollinating mechanisms of genetic isolation may be important. There are, however, several examples of a single bee pollinating different varieties (Adams 1991) and species of *Dendrobium* (Adams *et al.* 1992, Bartareau 1993b). For example, Bartareau (1993b) found that *D. lichenastrum* (F. Muell) Krzl. emend Dockr. and *D. toressae* (Bailey) Dockr. were pollinated by common *Trigona* bee pollinators, but artificial pollinations between the species have so far been unsuccessful (Bartareau 1994). In this study, plants of var. *canaliculatum* and *nigrescens* were pollinated by two species of native bee, placement of the pollinia on the pollinator was constant and individuals could be artificially crossed. These results imply that pollinator specificity or a post-pollination mechanism would not maintain genetic isolation between these varieties. It is only under geographical separation that reproductive isolation of populations may occur. Perhaps, as these varieties flower at the same time and present a similar floral display and fragrance to attract pollinators, then pollination by multiple *Hylaeus* bees and outbreeding has been a factor in the evolution of floral variation in *D. canaliculatum*.

Dendrobium canaliculatum is generally recognisable in the field by distinctive morphological characters and the construction of an artificial botanical key which separates the species or varieties is not possible because of the inconsistent variation in flower colour, perianth shape and shoot morphology (Dockrill 1992). Variety *foelschei* could be considered a species on the basis of its geographical isolation. However, if such a change in geographical distribution is considered an argument for speciation then the isolated populations of var. *foelschei* in the Kimberleys would be a separate species from those populations in Arnhem Land. There is evidence that changing climate and activities of man have reduced many *Melaleuca* woodland habitats supporting *D. canaliculatum* to scattered relics (Webb 1966, Barlow 1981, Lavarack 1994, Bartareau and Skull 1994). Hence, information on the distribution patterns of varieties in *D. canaliculatum* should be interpreted with caution, especially when correlated with classification schemes.

At present there is no evidence of a pre- or post-pollination mechanism which maintains genetic isolation between varieties of *D. canaliculatum* to support Clements (1989) elevating var. *canaliculatum* and var. *nigrescens* to species. A recent re-evaluation of the *D. canaliculatum* complex by Dockrill (1992) concluded that there were only two tenable varieties, namely var. *canaliculatum* and var. *foelschei* and that each are highly variable with intergrading forms. Variety *foelschei* is prevented from interbreeding with var. *canaliculatum* by geographical isolation, but species status is not warranted. This study supports the classification scheme by Dockrill (1992), illustrates the importance of identifying an isolation mechanism leading to speciation and highlights the need for further study of Australian orchids.

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Table 1: Confirmed, probable and suggested pollinators of *Dendrobium canaliculatum* var. *canaliculatum* and *D. canaliculatum* var. *nigrescens*. at five sites in north-east Queensland.

Variety	Pollinator	Site[a]	Pollinator status[b]
canaliculatum	*Hylaeus albonitens* Cock.	1	S
	H. chromaticus Cock.	1, 2, 3, 4	C, C, P, P
	H. ruficeps Sm.	1, 2, 3, 4	C, C, P, C
nigrescens	*H. albonitens*	1, 2	S, S
	H. chromaticus	1, 2, 4	C, C, S
	H. ruficeps	1, 2, 4	C, C, S
Not specified*	*H. theodorei* Perkins	5	S
	H. ruficeps	5	S

[a] Walsh River[1], Herberton garden[2], Sunday Creek[3], Townsville[4], Atherton[5] (17° 16'S, 145° 29'E).

[b] Criteria of Adams and Lawson (1988): C = confirmed, observation of pollinia removal and pollinia deposition on the stigma of a flower; P = probable, observation of pollinia removal but deposition of pollinia on a stigma not recorded; S = suggested, observation of flower visitation with or without pollinia attached to its body.

* Observations by Bruce Gray (cited in Jones 1983).

Table 2: Results of artificial pollination experiments of *Dendrobium canaliculatum* var. *canaliculatum* and *D. canaliculatum* var. *nigrescens*.

Variety	No. of trials per treatment	Number of capsules per pollination treatment		
		Self-pollinations	Cross-pollinations[a]	Cross-pollination[b]
canaliculatum	10	2	9	7
nigrescens	12	3	10	5*

[a] Within variety. [b] Between variety. * $x_2^2 = 0.89$, $P = 0.63$.

SLAB CULTURE OF AUSTRALIAN EPIPHYTIC ORCHID SPECIES

Erik Lielkajis
115 Reservoir Road, Mt Pritchard, N.S.W. 2170

Growers interested in cultivating a range of native orchid species will be aware that most of these are unsuited to growth in containers. All epiphytic as well as lithophytic species, with the exception of, *Cymbidium canaliculatum* and *C. suave,* can be successfully grown through slab culture. This form of cultivation relies on the grower being familiar with the conditions in which these species are naturally found. Therefore the following guidelines are generalisations and adjustments are required for individual species and the growing area in which they are to be placed.

The choice of a slab is restricted only by its potential longevity and a close to neutral pH level. Timber with attached bark is not recommended as the area under the bark is prone to both insect infestation and fungal growth. My preferred choices are first cut cork bark, tree fern slabs — after the removal of tannins — and hardwood timber such as teak. Cork is suitable for most species but where higher moisture and humidity levels are desirable, such as for *Bulbophyllum* spp., treefern can be more appropriate. Strips of hardwood will provide rapid water shedding as well as the long root run required by several *Sarcanthinae* spp.

Water is retained by slabs for a limited time, therefore watering should be on a daily basis except where low temperatures may inhibit drying of the exposed parts of the plant. As a general rule watering should be reduced proportionally as temperatures fall toward the plants cold tolerance level. Most artificially heated glasshouses have low humidity levels because of the heating process and it may be necessary to maintain daily watering throughout winter. Watering is best carried out by hand to avoid wetting the inflorescences and where optimum temperatures cannot be maintained, to bypass those plants that have been forced into a semi-dormant state.

High humidity is desirable, although not necessarily through direct watering of the plants as fungal problems can result. To maintain humidity in my growing areas the floors are planted with *Selaginella* sp., a low growing but dense fern-like plant, this is kept moist with a downward facing ground watering system. Any clean surface material that retains moisture is suitable and ground watering can be carried out by hand or an irrigation system.

Air movement is vital to good culture and in closed structures it will need to be supplemented by a system of fans. It is hard to envisage too much air movement, epiphytic orchids naturally occur in environments where there is at a minimum, a constant draught, ranging to high winds in some areas.

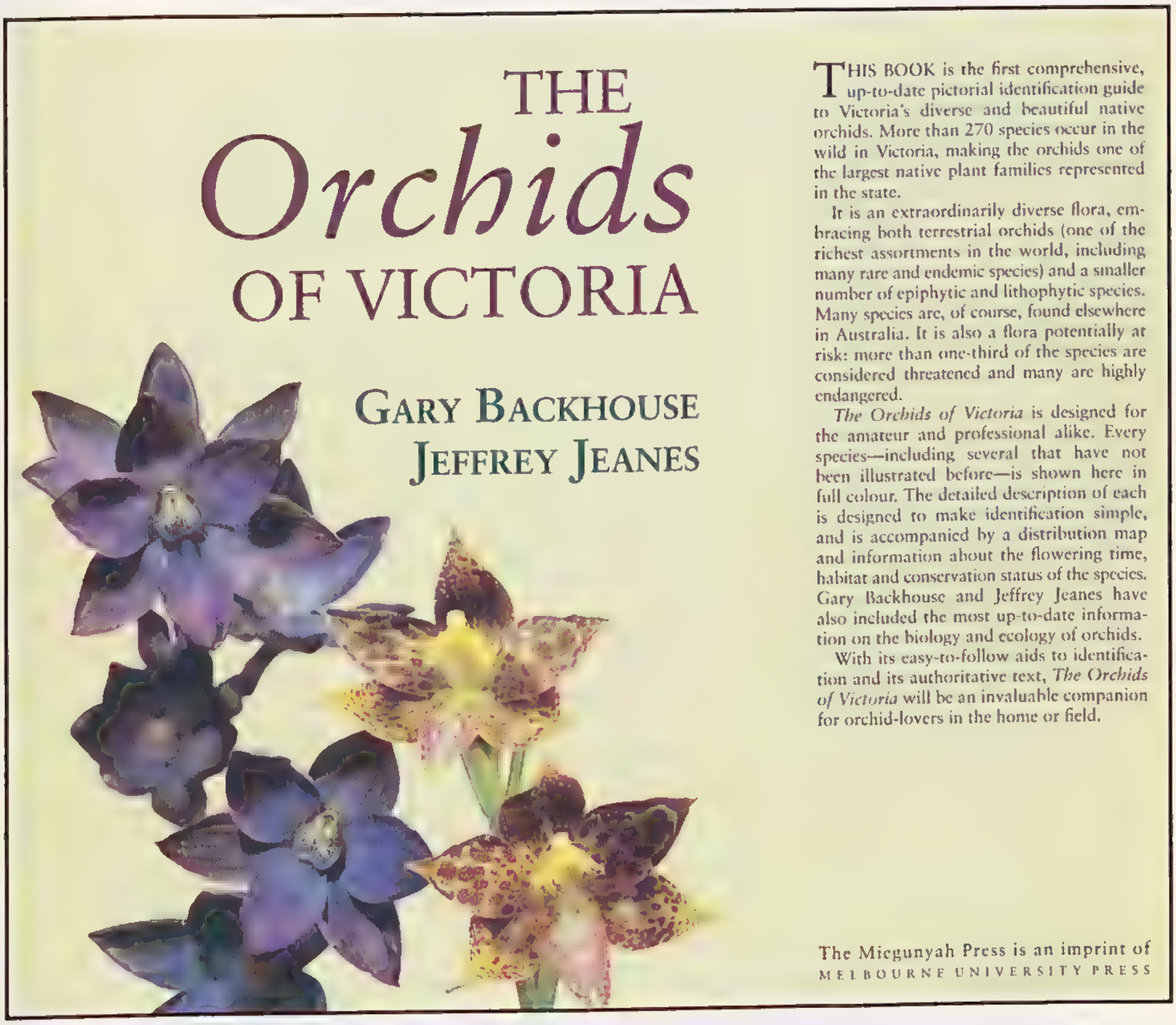
Fertilising should be carried out quite often, every seven to 10 days, as there is little residual value, but at a very much diluted rate. As the slab is expected to be permanent, only organic fertilisers should be used, otherwise accumulated chemical salts may cause damage to the plant's root system.

Some species are extremely delicate and direct application of pesticides is not recommended. It is preferrable for emphasis to be placed on exclusion of pathogens as well as constant monitoring for early symptoms, rather than relying on a chemical arsenal when a disease problem becomes entrenched.

The slabs can be situated on galvanised mesh frames, or suspended from the roof or benches. Positioning should be based on duplicating each species natural growing conditions. Plants closest to the floor will receive higher humidity, less light and lower temperatures, those nearest the roof will receive lower humidity, increased light and higher temperatures.

If you have adequately provided the basic elements of humidity, light, temperature and air movement the results will be evident with time. Disbelieve any claims that a miracle product can significantly boost the growth of your plants, instead rely on patience and an understanding of each species requirements. ✤

BOOK REVIEW



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THE ORCHIDS OF VICTORIA
By Gary Backhouse and Jeffrey Jeanes.
Published by The Melbourne University Press.
256mm x 184mm. Hard cover – cloth.
400 pages.
ISBN 0 522 84393 X
Retail price $59.95.

Jeff Jeanes sent me the dust jacket and I have reproduced it above. The book is to be published on 5th June, 1995. Illustrated on the dust jacket are: left *Thelymitra epipactoides*, right *T. benthamiana.*

Jeff writes — "The book covers all 270 or so orchid species currently recognised for Victoria. Each species gets a full page and information includes a description of the plant, distribution map, colour photograph and information on habitats, flowering time, conservation status, etc. Botanical keys to genera and species as well as a few introductory chapters are supplied."

Further inquiries can be made to:–
Jeff Jeanes (03) 9655-2346
or
Tim Mitchell (M.U.P. Marketing and Promotions Manager) (03) 9347-3455. ✾

AUSTRALASIAN ORCHIDS ILLUSTRATED

No. 17: *Caleana major* R. Br.

Common Name:	Flying ducks, Large duck orchid
Subfamily:	Orchidoideae
Tribe:	Diurideae
Subtribe:	Caladeniinae
Genus:	*Caleana* R. Brown

Distribution: The genus *Caleana* is restricted to Australia and New Zealand. Although *Caleana major* is not commonly found, it occurs from south-east Queensland through N.S.W. and Victoria to Tasmania and South Australia.

Notes: Over the past few years the number of species recognised in the genus *Caleana* has increased, primarily due to the reinclusion of species from the *Paracaleana.* There are approximately 11 species recognised in the genus although a few more are proposed. *Caleana major* is the type species of the genus and was described in 1810 by Robert Brown. All species of *Caleana* are terrestrial orchids and are usually found growing in heathlands or open forest. The plants have a signle basal leaf and the flowers do not twist during development leaving the lablellum projecting upward and giving the impression that the flower is upside down. The curved column of *Caleana* has large wings which assist in trapping the pollinator. The labellum is hinged to the base of the column by a long curved claw, which will swing the pollinator into the reproductive region of the column. *Caleana major* is a distinctive orchid, which is readily distinguished by its resemblance to a flying duck. The combination of the column (with the broad column wings), the dorsal sepals and the lateral petals resemble the body of the duck. While the labellum on the curved claw resembles the head of the duck and the reflexed lateral sepals resemble the wings of the duck in flight.

Pollination: *Caleana major* has been reported to be pollinated by two species of sawflies. The pollinators were male sawflies which were considered to be sexually attracted to the flowers. As the males approached the flowers they attempted to land on, or fly off with, the labellum. The movable labellum would then swing the sawfly against the column where it picks up the pollinia for transfer to the stigma during another swing (this method will result in both self and cross pollinations). It was not determined if the sawflies were attracted to the flowers by a chemical signal as well as the physical similarity of the labellum to female sawflies.

Conservation Status: *Caleana major* is a widespread species and is not considered to be endangered.

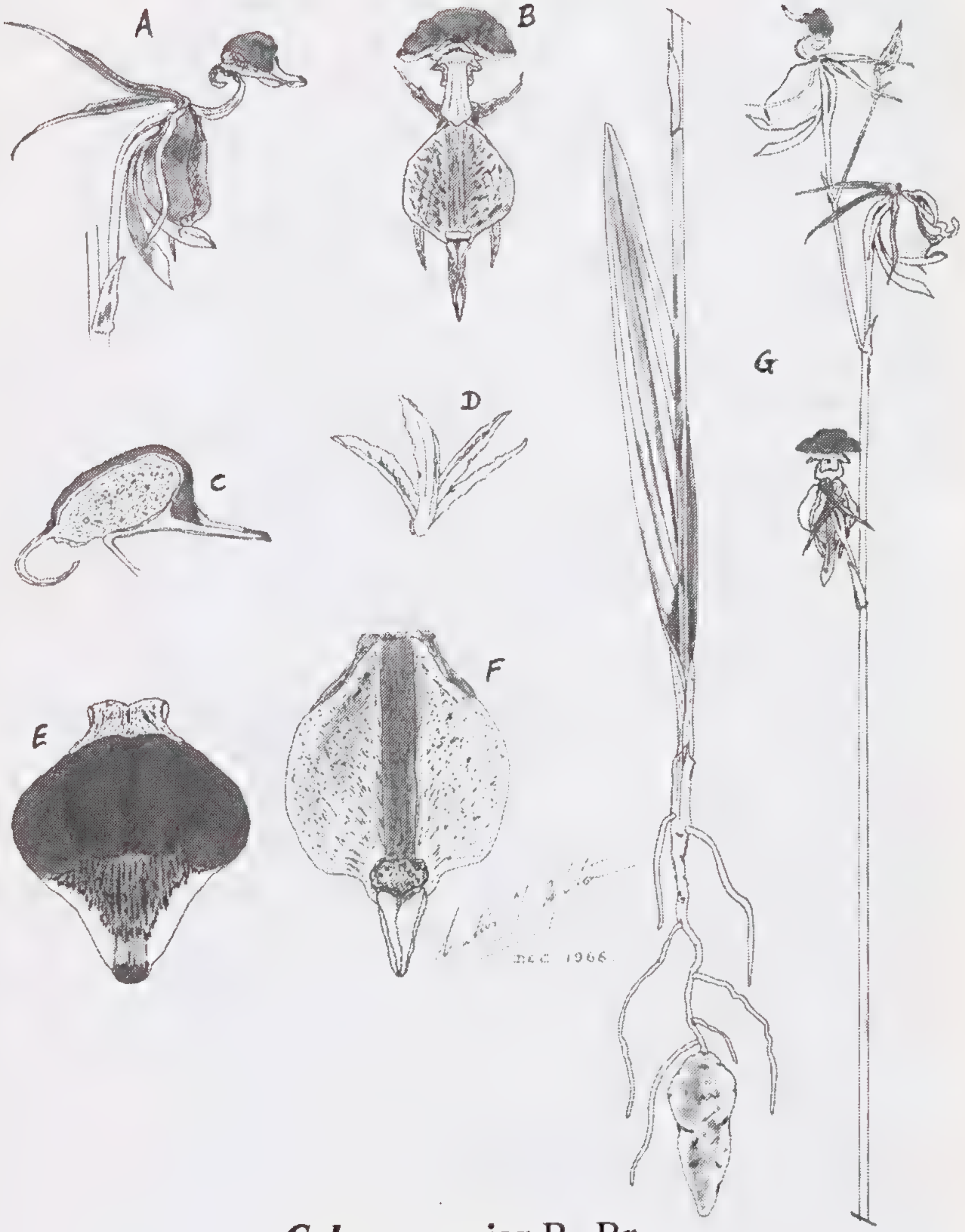
Culture: This orchid is extremely difficult to cultivate and should only be attempted by an experienced terrestrial grower.

Illustration: Painting: Illustrated is a single flowering stem with two flowers in profile showing the resemblance of the flowers to ducks in flight.

Description: Tony Slater, 17 Dudley Street, Mitcham, Victoria 3132.

Illustration: Vikki Harvey, School of Fine Art, Suite 2/70 Edith Street, Wynnum, Queensland 4178.

Line Drawings and Captions: Walter T. Upton, P.O. Box 215, West Gosford, NSW 2250.



Caleana major R. Br.

Wakehurst Parkway, near Oxford Falls.

A.	Flower, side view	2X
B.	Flower, front view	2X
C.	Cross-section of labellum	4X
D.	Pollinia	approx. 12X
E.	Labellum, from above	4X
F.	Column, front view	4X
G.	Plant	1X

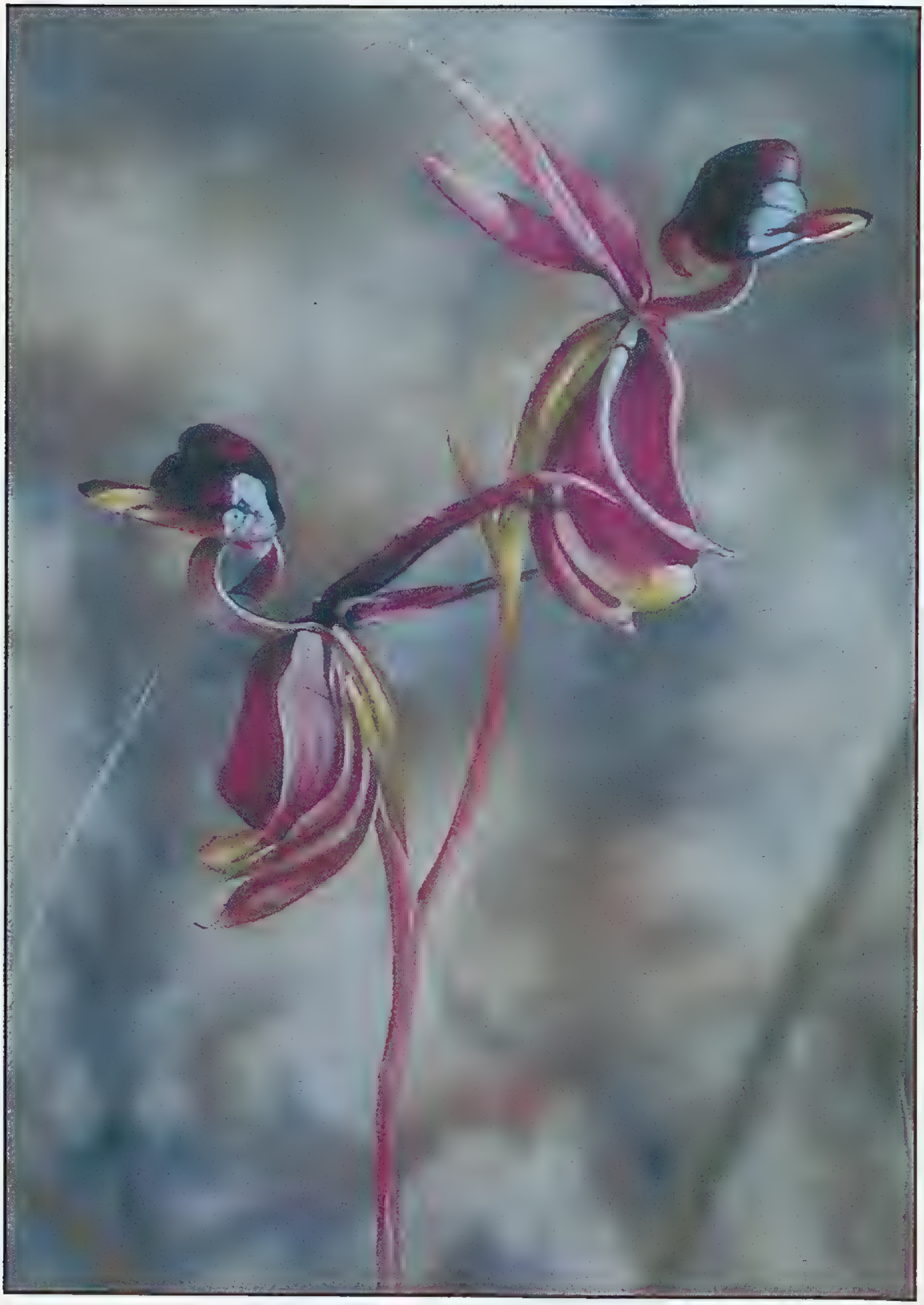


Plate 33: *Caleana major* R. Br.
From a pastel drawing by Vikki Harvey.

NOTICE FROM A.N.O.S. COUNCIL

THE AUSTRALASIAN NATIVE ORCHID SOCIETY INC., ANNUAL GENERAL MEETING AND ELECTION OF COUNCIL AND ADVISORY COMMITTEE MEETING

The above meetings of the Society will be held on Saturday, 29th July, 1995 at the Wollongong Botanic Gardens, western end of Madoline Street, Gwynneville. If approaching from Sydney take Gwynneville turn off from Mount Ousley Road (Highway 1), turn right into University Avenue (this will take you across the bridge over Highway 1). Turn right into Irvine Street and then turn left into the next street, Madoline Street. The meeting will be hosted by the Wollongong and District Native Orchid Society Inc. and will commence at 10.00 a.m. Morning tea will be available from 9.30 a.m. Please bring your own picnic lunch and relax and enjoy it outside in the beautiful botanic gardens. B.Y.O.

The main business will be the election of Council for 1995–1996.

The A.N.O.S. Advisory Committee Meeting will be held in conjunction with the above, commencing after the closure of the Annual General Meeting.

A.N.O.S. Groups and associated Native Societies are requested to advise the secretary the names of their delegates to the Advisory Committee Meeting or to nominate proxies (if required) before 22nd July, 1995.

NOMINATION FOR ELECTION TO COUNCIL

Nominations for the election of A.N.O.S. Council are called for. These should be signed by a member of the Society, countersigned by the nominee accepting nomination and lodged with the secretary no later than the 22nd July, 1995. Positions to be filled are: President, Vice President, Secretary, Treasurer, Editor plus seven Councillors.

DO NOT BE A DELINQUENT SUBSCRIBER

If you are, you will not receive the September issue of *The Orchadian*. The Membership Renewal Application was included in the March issue. If you are unsure of your financial status, check the address label of this issue.

95 — (followed by your postal area code number) means Renewal necessary. Financial to 30/6/1995.

96 — (followed by your postal area code number) means Renewal not necessary. Financial to 30/6/1996.

If you have misplaced your Membership Renewal Application, another is enclosed. Send this and your remittance or credit card authorisation to:–

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AROUND THE GROUPS

A.N.O.S. OF W.A. Inc.

At their recent A.G.M. the following officers and committee were elected:–

President:	Ross Wilton
Vice-President:	Rod Bitton
Secretary:	Beverley Britton
Treasurer:	Phil Bunney
Registrar and Show Marshall:	Rod Britton
Committee:	Margaret Britton, Mike Burgess, David Edgell

Please address all correspondence to the secretary at 95a Ewen Street, Scarborough, W.A. 6019. ✻

A.N.O.S. NORTHERN REGIONAL COUNCIL

The fourth meeting of the Council hosted by A.N.O.S. Wide Bay Group took place at Maryborough on 25th February, 1995. Delegates from the seven affiliated groups were in attendance.

The following is a list of the decisions made:–

Finance: Bank balance $819.00. Annual subscriptions to be payable at beginning of financial year — 1st July. A Foundation Membership be established at $10.00 and a numbered certificate be presented. Foundation members to be associate members only for the year of duration — 1st July, 1995 to 30th June, 1996.

Insurance: R. Kanowski to investigate further Sun Alliance Insurance cover.

Conservation. No further action on the Conservation Bill until the regulations are drafted and can be studied.

Governing Body for A.N.O.S. John Hazelwood reported that the meeting he attended to consider the formation of a governing body gave him a clear indication that it did not wish to be over regulated.

Registrar's Report. A subcommittee within the Judging Panel is planning future judging classes. These classes will be held at the weekends, once a month. Those participating will pay for the cost of lecturers, their travel, etc.

General Business. Decided not to affiliate with O.C.Q. at this point in time. Mackay Group to investigate hosting the August meeting. N.O.S.T.I. to look at chartering a bus to run from Toowoomba to Mackay picking up on the way. ✻

NEWS FROM THE A.C.T.

An Orchid Book, a Show and a Conference

Sheila Cudmore
President, Orchid Society of Canberra Inc.

The Orchid Society of Canberra has recently published a book "Growing Orchids in Canberra and Other Cool Climate Districts". The 21 chapters in the book are personal accounts of growing orchids in the A.C.T. and includes four chapters on native orchids. One of these chapters is on four seasonal walks around the A.C.T. looking for native orchids. the other three, are on growing *Dendrobium kingianum, D. speciosum* and terrestrials, in a climate that can be very hot and dry in the summer and very cold and somewhat wet with freezing overnight temperatures in the winter. The book has 64 pages and is printed on superior paper with a coated cover and contains four pages of coloured photographs of orchids grown in the A.C.T. plus many drawings.

The book will be on sale at the South-west Regional Show and Conference that the Orchid Society of Canberra is hosting in the A.C.T., on the long weekend of October, 1995 (30th September–1st October). Both the Show and Conference will be held at the Canberra Institute of Technology, Reid Campus. The Show includes a competition of displays by the South-west Region for a trophy donated by the Orchid Society of N.S.W. The Conference, open to all, will include one of the walks from the book and lectures from well-known speakers including Dr Ben Wallace of the Australian National Botanic Gardens and Mr Walter Upton, native hybridiser and author.

For further information on the book, which can also be obtained by post from the Society, the Show and Conference write to P.O. Box 612, Canberra City, A.C.T. 2601. ✻

LETTER TO THE EDITOR

27 Harvest Road,
North Fremantle, W.A. 6159
Tele/Fax: (09) 335-7107

The Editor, *The Orchadian*

I refer to "Pollination of *Bulbophyllum macphersonii* Rupp by a Midge Fly (*Forcipomyia sauteri*)", *The Orchadian,* Volume 11, Number 6, December, 1994.

Tad Bartareau, in the introduction to his article refers to Australian Indigenous Orchids (A. W. Dockrill, 1969), when he quotes that *Bulbophyllum macphersonii* grows above 500m in north-east Queensland.

I write to extend its range down to sea level.

In February, 1993, I was master of a tourist cruise vessel operating in the Daintree River, far north Queensland. To avoid the strong currents and associated flotsam, subsequent to some 380mm of rainfall during the previous 24 hours period, I decided to investigate some of the creeks feeding the Daintree River. The extra 1.5m of flood water and high tide at the time made this quite practical and safe.

I chose Forest Creek, one of the larger streams in the area and proceeded up it. My way was stopped some 200m along it by an Apple Mangrove tree, toppled by the rain and flood waters, across the creek. I secured the vessel to the fallen tree and turned the engine off to let my passengers listen to and observe the wildlife in the mangroves. Growing on the fallen tree, in addition to the ubiquitous *Dendrobium discolor* was a large patch of *Bulbophyllum macphersonii.* My hasty identification at the time was confirmed by later flowering, the flowers were of a bicolour (maroon and green) form that I had not previously seen.

The orchid was subsequently broken up and relocated into several safer (out of the creek) locations.

Sincerely, Rod Bitton ✾

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Cultivation of Australian Native Orchids – 2nd Edition, A.N.O.S. Victorian Group	$12.00
Orchids of Western Australia – Cultivation and Natural History	$6.00 each

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Volume 8 – complete (limited)	$36.00
Volume 10 – complete	$36.00

Some numbers of Vol. 8, 9 and 10 are available at $3.00 per issue.

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* * * * * *

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IRA BUTLER TROPHY COMMITTEE — CORRIGENDA

There were several unfortunate omissions in the report of the Ira Butler and Bill Murdoch Trophies for 1994.

A.N.O.S. W.A. Inc. submitted *Dendrobium* Yondi X Zip 'Red Emperor' for which F. and H. Vernon received a Silver Ira Butler Trophy. They also submitted Phillip Bunney's *D. speciosum* var. *hillii* for the Bill Murdoch Trophy.

Also omitted was Bob Lewry's *Parachilus* Polka Dot 'Purple Haze', hybridised by Neil and Meg Finch which had received an H.C.C. from the Orchid Society of N.S.W.

For these omissions, we apologise.

Ruth Rudkin, Secretary I.B.T.C.

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QUEENSLAND

- **A.N.O.S. Gold Coast,** Hon Sec, PO Box 330, Ashmore City 4214. Meetings 1.30pm last Sun each month, Community Centre, Lawson St, Southport
- **A.N.O.S. Logan,** Hon Sec, PO Box 2103, Crestmead 4132. Meetings 2nd Wed each month at 8pm, Logan City Works Depot, Cnr Kingston Rd & Smith Rd, Woodridge
- **A.N.O.S. Mackay & District,** Hon Sec, 98 Bedford Rd, Andergrove 4740. Tel: (079) 55-1631. Meetings 8pm 2nd Thurs each month, Andergrove Neighbourhood Centre, Bedford Rd, Mackay
- **A.N.O.S. Townsville,** Hon Sec, PO Box 1147, Aitkenvale 4814. Tel: (077) 78-4311. Meetings 8pm 1st Tues each month, Townsville Orchid Society Hall, Pioneer Park, Ross River Rd, Kirwan
- **A.N.O.S. Wide Bay,** Hon Sec, PO Box 15, Tinana 4650. Meetings 7.30pm 4th Wed each month. Neighbourhood Centre, Bazaar St, Maryborough
- **A.N.O.S. (Qld.) – Kabi,** Hon Sec, PO Box 49, Sandgate 4017. Tel: (07) 284-3289. Meetings 7.30pm 2nd Tues each month, Nashville State High School, Barfoot St, Nashville
- **Native Orchid Society of Queensland,** Hon Sec, PO Box 159, Broadway 4006. Tel: (07) 355-2283. Meetings 7.30pm 1st Mon each month, Bread House, 49 Gregory Tce, Brisbane
- **Native Orchid Society of Toowoomba Inc.,** Hon Sec, PO Box 2141, Toowoomba 4350. Meetings 7.30pm 1st Fri each month, Red Cross Hall, Hall Lane (off Neil St), Toowoomba

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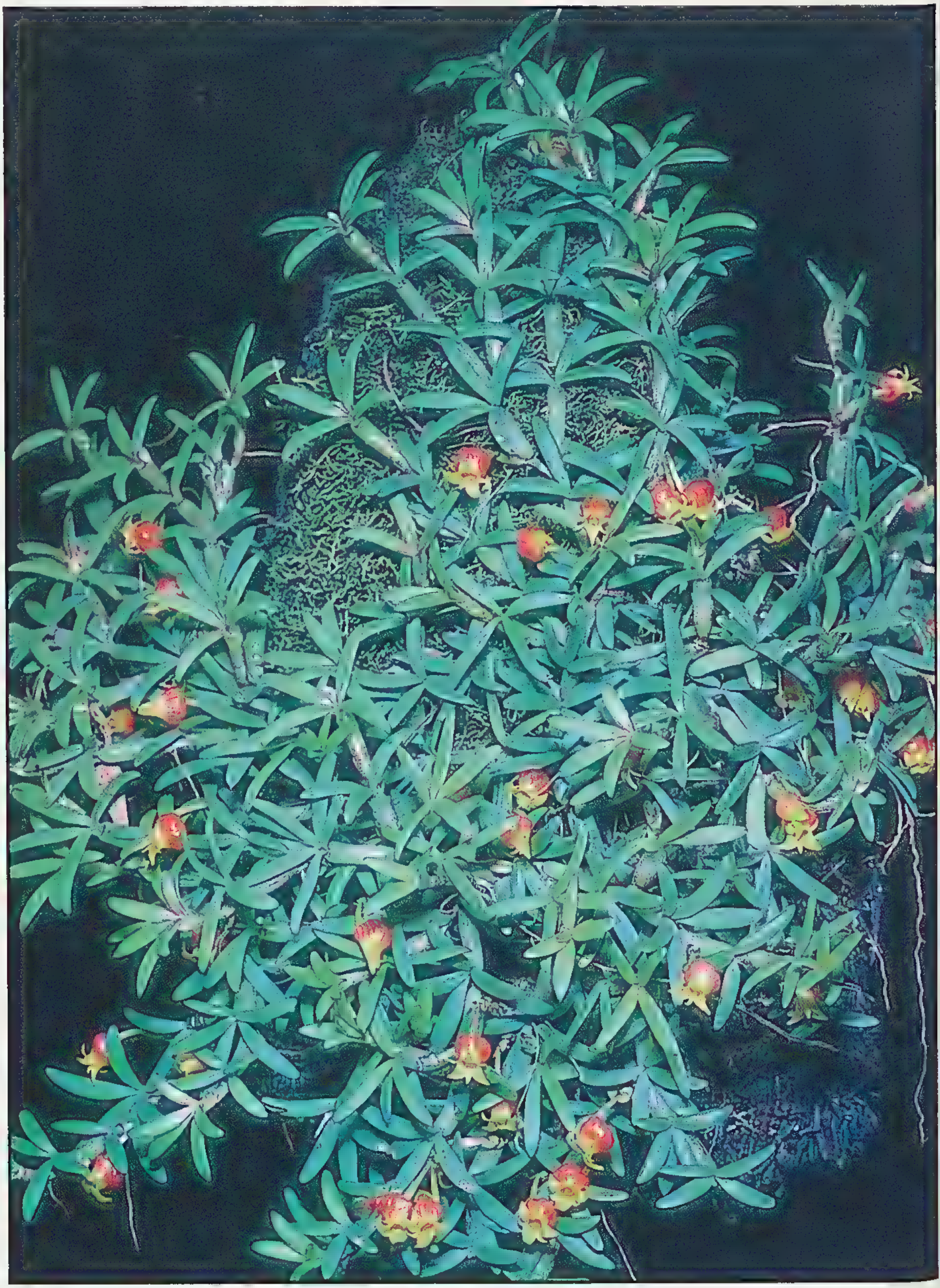

Plate 34: *Mediocalcar decoratum.* Photo: D. Titmuss.

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Volume 11, Number 9 September, 1995

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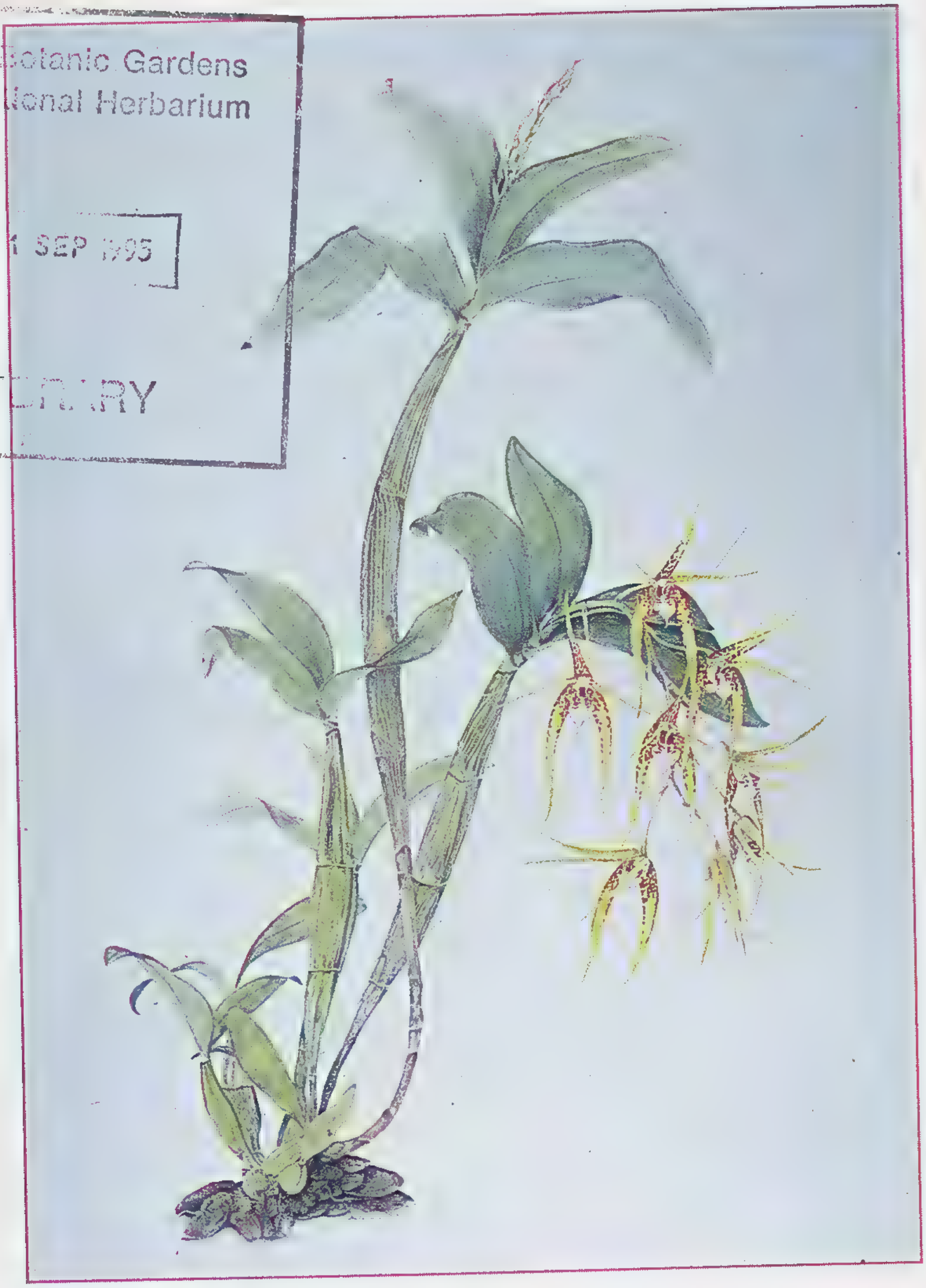

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TALKING POINT

Throughout the world one is continually hearing of a depression in the commercial side of our hobby, the large and well known commercial growers, who have been with us for so long, are disappearing and in their place is a whole new breed of smaller ones. Are we losing all this expertise, or is this progress, a new direction? Maybe! I have often been asked where certain orchids can be purchased and now it is more and more difficult to direct the would be buyer to a commercial nursery where all needs can be satisfied. Is this because sales of orchids are frequently taking place at society sales tables or through backyard growers? Is this a good thing? These sales only serve those who belong to societies and there are many who do not. The main problem with this is a large number of the backyard hybridists do not have the expertise or the quality of parent plants to advance our native orchids. Another angle I do not like is that many hobby supplies and growing accessories are not always available to us. Fortunately this does not seem to affect us, the native growers, as much as the exotic orchid growers, but I do sense a lull in our advancement of hybrids and improvement of species at the present time. Someone, recently, said we need a new gimmick, particularly as far as our native *Dendrobium* hybrids are concerned, we have come as far as we can with the kingianum/tetragonum/hot-cold type hybrids. I do not really believe this, except they are beginning to look all alike, but some of the new colours are impressive. I do not believe in gimmicks but I do agree we will have to come up with some new shapes by using different species as parents, there is still quite a few that have not been used. There is no need to be despondent in this regard, as we do have a very unique orchid flora, particularly if Australasian species are also used. Maybe I have let my thoughts get away with me this time. What are your thoughts?

Incidentally another problem that keeps rearing its head, the many plants we are showing as Australian natives, which quite definitely are not. The one that immediatley comes to mind is *Dendrobium teretifolium* 'Black Pam', it is not an Australian native, it was collected in New Guinea, unfortunately it has been used in hybridising, the progency are, however, quite distinctive as the flowers have many dark purple blotches on them. A *D.* Virginia Jupp hybrid has been made using this species as one of the parents, this is often benched in an Australian Native Hybrid class, but should not be judged in this class. Judges should be better informed on these problems.

Another dislike of mine is the use of the word spike when we are talking about a raceme and not a spike. A raceme is an inflorescence that bears pedicellated flowers, whereas a spike has sessile flowers.

Walter T. Upton

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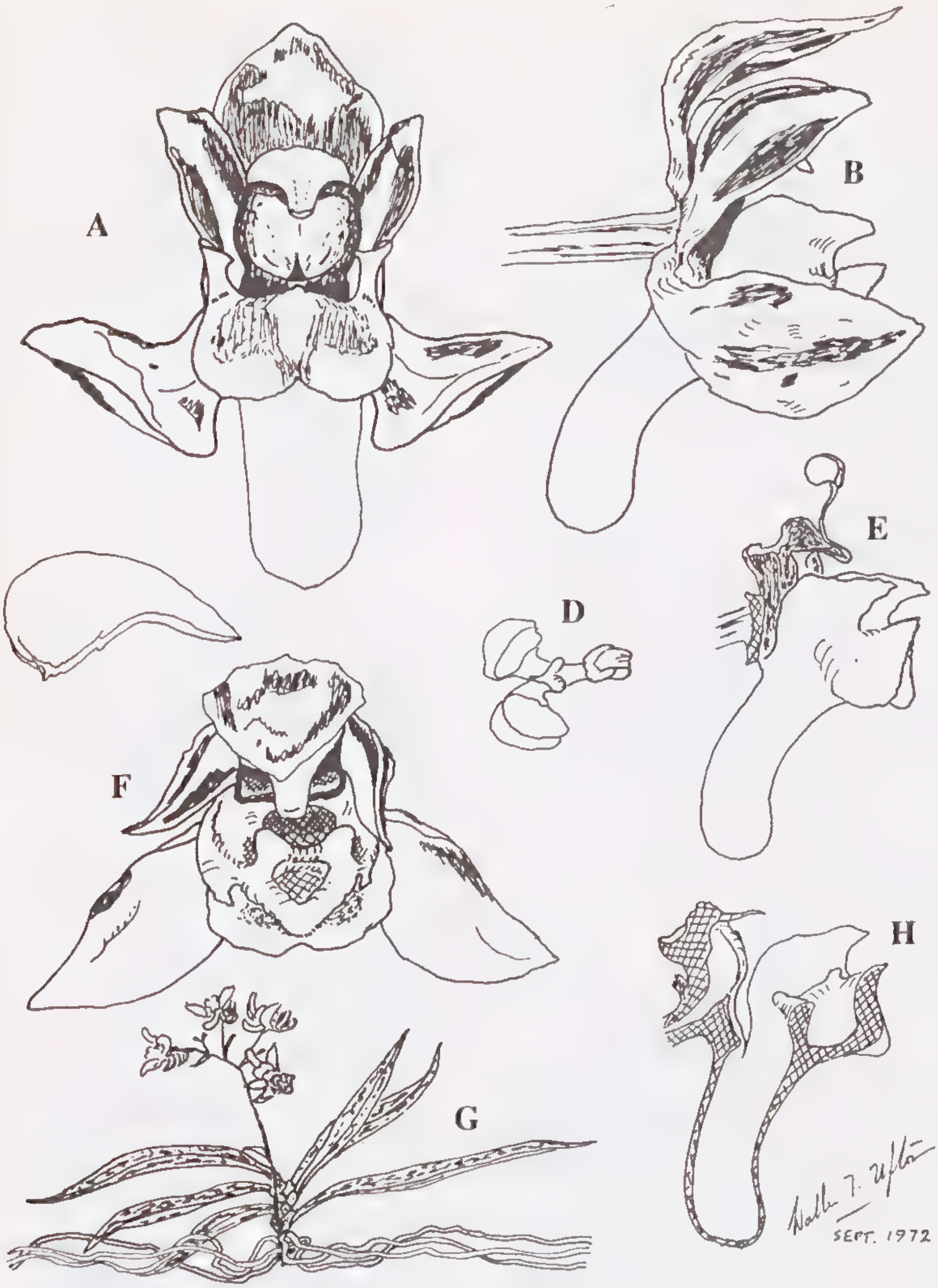
SCHISTOTYPLUS PURPURATUS — UNCOMMON OR JUST INCONSPICUOUS?

Schistotylus purpuratus appears to be a poorly known species, or at least that is the impression gained from the literature (or rather, lack of) on this species. Even the most basic knowledge of its distribution seems a bit sketchy. Dockrill (Aust. Indig. Orchids 1994) notes that it occurs between the upper Manning River and upper Nymboida River catchments, between 600 and 900m altitude, growing on twigs of rainforest trees and on *Leptospermum* in open forest (this despite the only known population on *Leptospermum* being at almost 1,100m). Jones (Native Orchids of Aust. 1988) records it as endemic to north-eastern N.S.W., in the Lismore, Dorrigo and Walcha districts. He notes that it has been reported from southern Queensland, but specimens are lacking. It is not recognised as occurring in Queensland by Stanley and Ross (Flora of South-East Queensland). However, both Jones and Stanley and Ross have overlooked a specimen in the N.S.W. National Herbarium collected from Mount Mee near Brisbane in 1944, so it no doubt still exists somewhere in south-east Queensland. As a further indication that this is not a commonly encountered species, there is a grand total of only five specimens in the N.S.W. National Herbarium, including the Queensland one, with the most recent collected in 1969 at Dorrigo and the others collected between 1912 and 1959. From current records, its main centres of distribution appear to be near Walcha (i.e. escarpment west of Wauchope) and near Dorrigo. It is either rare or overlooked in the area north of Dorrigo to the Queensland border. It is not recorded in the far north-east by Penman, Rankin and Moye (*The Orchadian,* 9, 5–9, 1987). The Lismore record is based on a specimen collected in 1912 and simply labelled "Lismore", which, like many of the localities recorded on early collections, could refer to anywhere within 50km or more of the town of Lismore. If actually near Lismore, the population has probably been exterminated along with most of the forest which used to exist in the area, but it may still occur in remaining forested areas nearby such as in the Macpherson Range or Nightcap Range areas and there is a single unconfirmed record from Border Ranges National Park.

Both *S. purpuratus* and the vegetatively similar *Papillilabium beckleri* are currently listed as nationally rare plants. Of course, as any orchid enthusiast knows, *P. beckleri* is widespread and can be quite common in suitable habitats and there is no question that it should be removed from the "rare" list. *Schistotylus purpuratus,* on the other hand, may be justifiably listed as rare.

I have long been intrigued by these two species. Over the years I have made a number of casual observations of plants of *S. purpuratus* without particularly looking for them, along the escarpment generally west of Wauchope and have always assumed that if I looked hard, they would be common in the right areas, as is *Papillilabium beckleri.* I recently had an opportunity to put that assumption to the test and spent a few days in the forests of the upper Manning and upper Hastings specifically looking for this somewhat elusive species. To my surprise, despite intensive searching in areas where I knew it occurred in the general locality, I drew many blanks. For several hours searching in each of over a dozen areas in suitable habitats between 600 and 1,100m altitude, I found only four populations and in two of these I saw less than six plants. All plants were growing on twigs and small outer branches. Three of the populations, including the smallest, were in wet sclerophyll forest of tallowwood (*Eucalyptus microcorys*) and brush box (*Lophostemon confertus*). The plants were mostly growing on outer twigs of *Trochocarpa laurina,* a common understorey tree in this area and a species well-known as an excellent epiphyte host. Occasional plants also occurred on *Caldcluvia paniculosa* and *Pittosporum undulatum.* The fourth and by far the largest and highest-density population occurred at



Schistotylus purpuratus (Rupp) Dockr.

Gloucester area

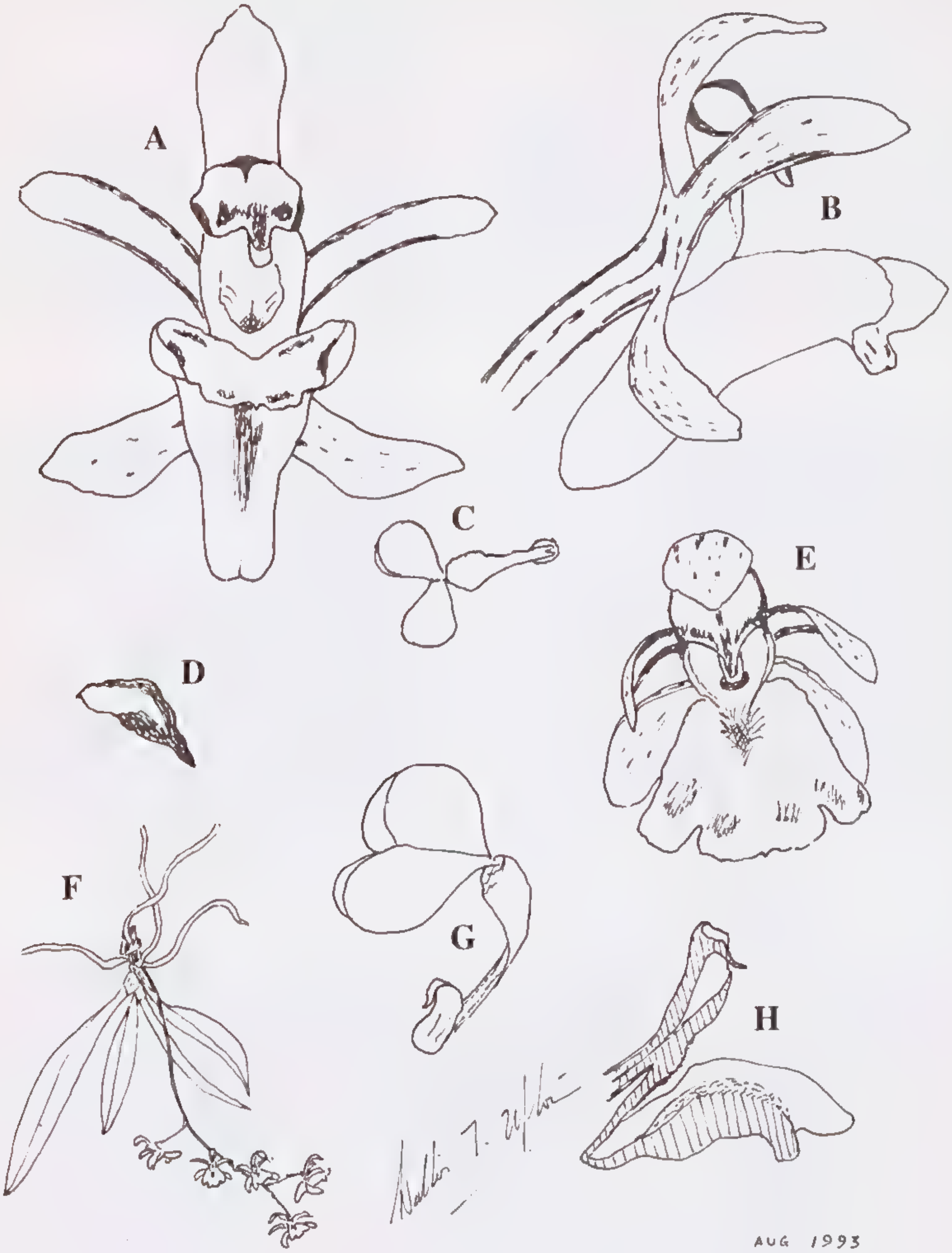
A. Flower, front view	10X
B. Flower, side view	10X
C. Anther	15X
D. Pollinarium	12X
E. Column & labellum, side view, pollinarium raised, anther removed	7½X
F. Flower, from above	10X
G. Plant	1X
H. Cross section of column and labellum	7½X

about 900m altitude in an unusual, low (in canopy height, about 12–15m) closed forest almost exclusively dominated by *Tristaniopsis collina.* I estimated several thousand plants over an area of several hectares. Most were growing on the outer twigs of the canopy species *T. collina,* but occasional individuals occurred on small trees and shrubs of *Alyxia ruscifolia* at the edge of the stand. Although the whole area was severely drought affected at the time of my visit, this forest appeared to be in a mist belt and thus a (normally) wetter microclimate than the sclerophyll forests, if the abundance of epiphytic mosses was any indication. Fortunately, the area is in a reserve and should be fairly secure. All populations of *Schistotylus purpuratus* were on ridges or upper slopes, rather than creeks or gullies. The drought had caused hardy *Backhousia myrtifolia* to wilt, drop half their leaves and turn the other half an unhealthy shade of brown. Despite this, the delicate *Schistotylus* were flowering happily, but most looked like they were a bit thirsty and the rest had **all** their leaves chewed off completely by hungry insects and in the longer term the drought will no doubt diminish the population sizes somewhat.

In contrast to *S. purpuratus, Papillilabium beckleri* occurred at virtually every site visited, but generally in low numbers. It was far more abundant along creeks (which is probably no surprise to anyone), where no *Schistotylus purpuratus* was found. Other orchids common in the areas where *S. purpuratus* was found included *Sarcochilus spathulatus* (probably the single most common orchid in the area, growing on a bewildering array of hosts, including vines of *Tetrastigma nitens* and 2m tall shrubs of *Psychotria loniceroides*), *S. falcatus, S. hilli, Plectorrhiza tridentata, Bulbophyllum exiguum, B. elisae, Dendrobium schoeninum, D. gracilicaule* and *D. mortii* (the old *D. tenuissimum*).

It is particularly noteworthy that from my (admittedly limited) experience, the two largest populations by far are in quite unusual and very distinct habitats, which are also quite different from each other. The two in question are the one in *Tristaniopsis collina* mentioned above and of course, the famous "west of Wauchope" population described by Mike Harrison, (*The Orchadian* Vol. 6 No. 11 p.265) which is additional to the four populations mentioned earlier. Despite what Mike suggests, I believe that this habitat is an essentially natural one for the orchid, although it has been extended by the construction of the earth dam. The dominant species, *Leptospermum polygalifolium,* commonly occurs naturally along swampy creeks on the tablelands and the stands on the upstream end of the dam appear to pre-date dam construction and be of natural occurrence. However, I agree with Mike that the orchid has benefitted from the dam, since it is more common in the younger stands of *Leptospermum* near the dam wall.

From my perspective the interesting question is whether *Schistotylus purpuratus* really is as uncommon as it seems and really does normally favour (with the exception of the *Tristaniopsis collina* population) the relatively drier, more open habitats with higher subcanopy light intensity (i.e. wet sclerophyll forest or *Leptospermum* shrubland rather than rainforest). I have very rarely seen it in rainforest, but then twig epiphytes are notoriously difficult to detect in the upper canopy which it would undoubtedly prefer. The apparent preference for wet sclerophyll forest could be simply because it is far easier to detect in those habitats. It may be very abundant in suitable patches of tall rainforest, growing on outer twigs 35m up in the canopy. As anyone who has successfully searched for it would know, it is often difficult enough to find plants growing in a 4m tall *Trochocarpa.* The chances of seeing these plants on the outer twigs of a 35m tall rainforest tree with dense intervening foliage must indeed be remote, even with a good telescope. I certainly haven't had much luck with binoculars. Apart from drawing on the experiences of others, I don't see any easy way of answering this question, short of felling a few likely patches of rainforest, obviously an unacceptably drastic option, or perhaps visiting likely areas after God has done a bit of felling with a few well-placed wind gusts. Let's shed some more light on this species! There must be



Walter T. Upton

AUG 1993

Papillilabium beckleri (F. Muell. ex Benth.) Dockr.

The Basin, Watagan Mountains

A. Flower, front view	10X	E. Looking into flower	10X
B. Flower, side view	10X	F. Plant	1X
C. Pollinarium	13X	G. Pollinarium	26X
D. Anther cap	10X	H. Cross section of column and labellum	6X

many reticent enthusiasts out there who have had experience with this species but have neglected to communicate the details on the assumption that everyone knows about it. I would love to hear from any such persons, preferably through the pages of The Orchidophile and I look forward to an enthusiastic and informative response!

Doug Binns ✤

Schistotylus purpuratus (Rupp) Dockr.

Walter T. Upton

When I decided to reprint the article by Doug Binns, from Sydney Group's Newsletter, on this species, it made me recall my first experience of seeing it in situ and I realise now that it is possibly the most southern recording of this species at this point in time.

In *The Orchadian* Volume 1 No. 2 page 21, an article by Don Stewart and Kel Ellis entitled: "The Orchids of the Gloucester District" gave a list of our native orchids from that area. I quote from this article:–

"**Wet scrub:** where moss and fern abound, providing a home for the lyrebirds, bower birds, platypus and scrub turkeys that frequent it. In this area we have found, *Bulbophyllum crassulifolium, B. exiguum, Calanthe veratrifolia, Dendrobium monophyllum, D. pugioniforme, D. tenuissimum, D. teretifolium* var. *fairfaxii, Sarcanthus beckleri, Sarcochilus olivaceus, S. spathulatus, Taeniophyllum muelleri* and *Sarcanthus purpuratus.*" You will notice that some of the names used then have since been reduced to synonyms.

The species we are writing about has already had five names in its short life:–

Cleisostoma gemmatum Rupp, Victorian Naturalist 54: 112–13, (1937) non King et Pantling (1898)

Cleisostoma purpuratum Rupp, Victorian Naturalist 54, 190 (1938)

Sarcanthus gemmatus (Rupp) Rupp, Victorian Naturalist 57: 219 (1941)

Sarcanthus purpuratus (Rupp) Rupp, Victorian Naturalist 58: 41 (1941)

Schistotylus purpuratus (Rupp) Dockr. Austral. Sarcanth. 30, t.43 (1967)

Looking through my 1963 diary and the entry on 21st September, I find that in the company of Don Stewart, Kel Ellis, Stephen Clemesha, Murray Corrigan and my son Colin, driven by Don in the Police Landrover, we travelled to the west of Gloucester and Oakey Creek. Eventually coming to the end of the logging trails we parked the Landrover and by foot, for many miles, we walked along the creeks, "where white man had never been before", viewing numerous species of orchid. At the time most of the creek beds were nearly dry, the under storey was lightly timbered beneath many larger trees, many precipitous cliffs were seen, no doubt waterfalls in wet times. Some of these required a long walk around to get to the lower levels.

It is absolutely breathtaking to be in this virgin bush, untainted by man, no exotic weeds or plants, pure Australian. It was in this pristine area that we found *Schistotylus purpuratus* growing at approximately 1.8m to 2.5m above the ground on small shrub-type trees on the tiny outer branches. I do not recall the tree species. The plants were scattered and were never numerous.

Growing in the vicinity of, and on, a large cliff by a waterfall, were hundreds of plants of *Dendrobium speciosum, D. kingianum* and *D. gracilicaule* and quite a few plants of the natural hybrid *D. Xgracillimum.* To see a cliff like this with the plants in full flower is something one never forgets, no way could we ever hope to duplicate this in our collections. The atmosphere was electric, every ingredient to make the perfect brew for growing success, was naturally there, humidity, the right amount of light and the continuous through movement of air.

In Doug Binns article he refers to both *Schistotylus purpuratus* and the vegetatively similar species *Papillilabium beckleri,* I therefore thought it would be a good idea to publish my drawings of these species to complement his article, see pages 405 and 407. ✤

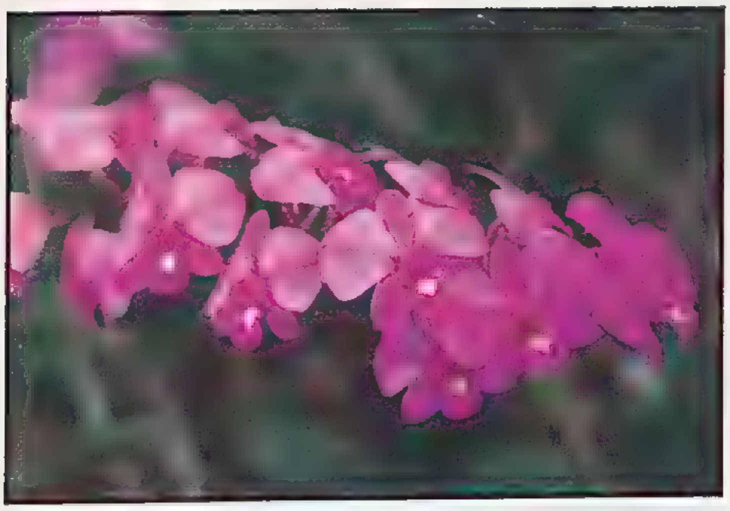


Plate 1: *Dendrobium bigibbum* var. *bigibbum* 'Moa'

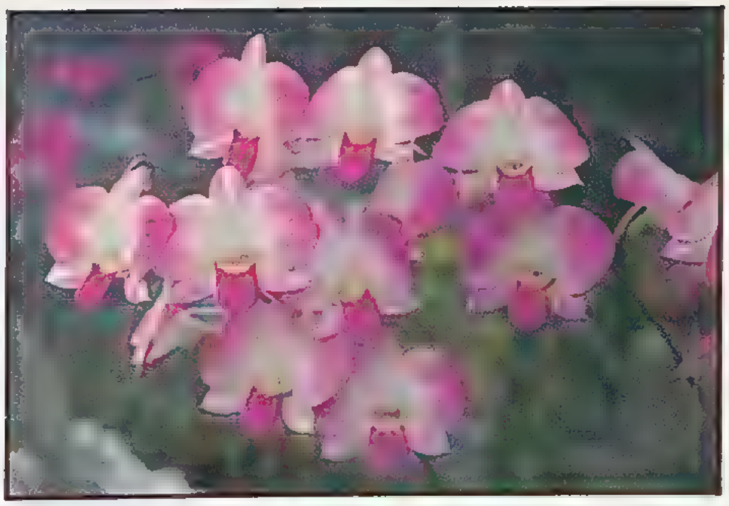


Plate 2: *Dendrobium phalaenopsis* (bicolor form)

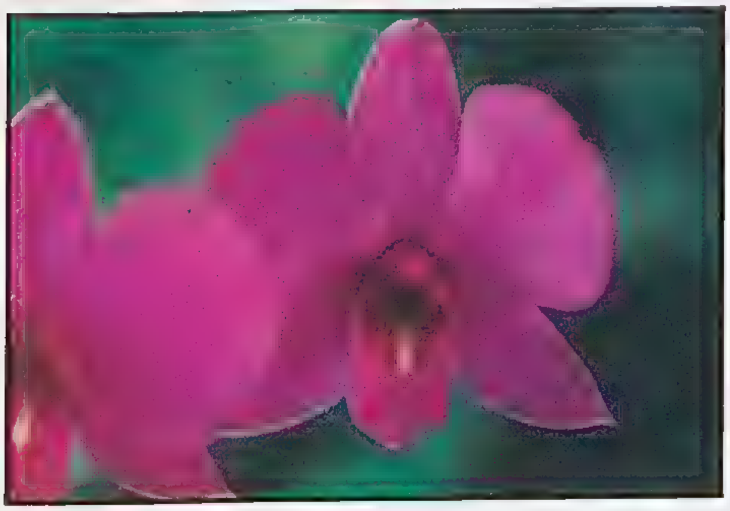


Plate 3: *Dendrobium bigibbum* var. *superbum* 'Red Princess' X *D. bigibbum* var. *bigibbum* 'Moa'

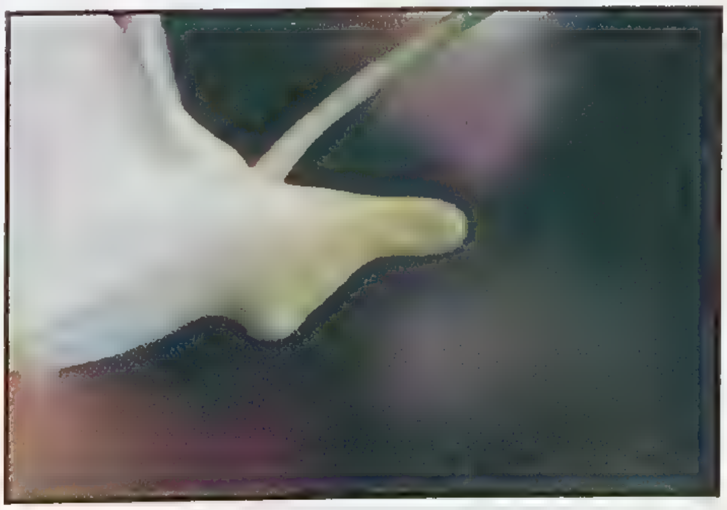


Plate 4: ? *Dendrobium phalaenopsis*

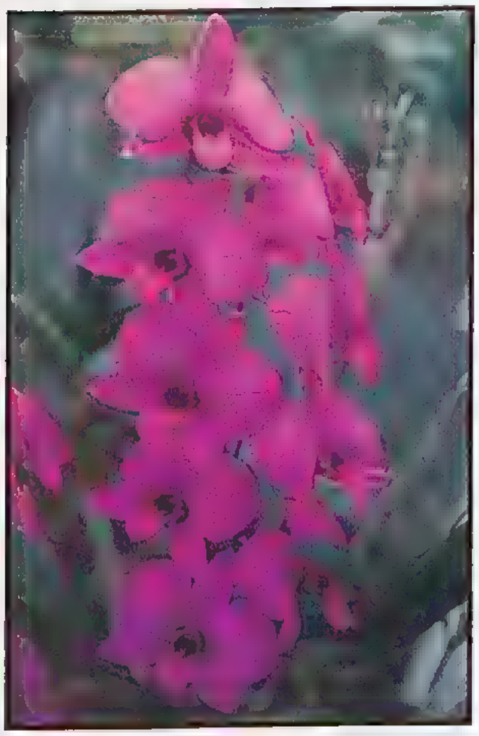


Plate 5: *Dendrobium bigibbum* var. *superbum* 'Red Princess'

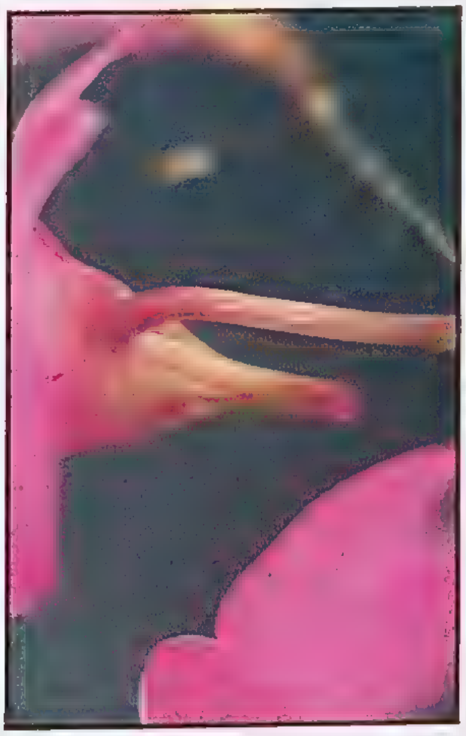


Plate 6: *Dendrobium bigibbum* var. *superbum* 'Red Princess' X *D. bigibbum*

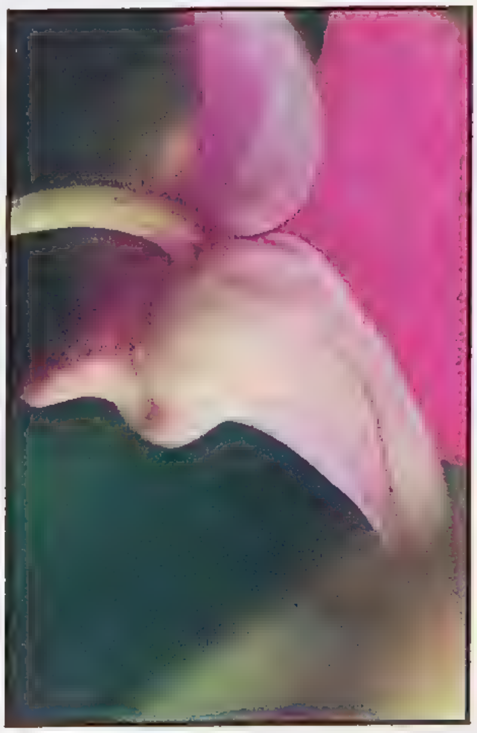


Plate 7: Complex *Phalaenanthe* section *Dendrobium*

Photos: J. Mewburn

BODGIE BIGIBBUMS

John Mewburn
Lot 55 Campbell Parade,
Beachmere, Qld. 4510

Well the autumn shows are over and once again we have seen an increase in the number of plants tabled as *Dendrobium bigibbum* which are anything but . . . some in fact may even be complex hybrids . . . why is this happening? Well the answer may lie up in north Queensland. When I lived there I saw many thousands of "wild collected" *D. bigibbum* and thousands of *Phalaenanthe* dendrobiums imported as *D. phalaenopsis*. Many of the imported plants I am now sure were in fact not species but complex hybrids sold as *D. phalaenopsis* because some of our Asian **"friends"** are not noted for complete honesty in business dealings and rather than miss a sale will write out a new name tag for anything they may be out of stock of at the time . . . it doesn't happen only in Thailand, an elderly "gentleman" who used to sell plants at Rusty's Bazaar in Cairns was quite proud of the fact that he used to take down the tourists who asked for a "Good Cooktown Orchid", making the sale was the important thing to him. Once I asked him how he got away with it for all those years, after all surely they would know the difference once they flowered the plant. "Maybe they won't", he said, "or maybe they won't ever flower it down there, maybe they'll die before it flowers, or maybe I will" . . . you can't argue with that sort of logic.

The situation became worse when Mark Clements claimed in the book *Australian Orchid Research* Volume 1 that *D. bigibbum* var. *superbum* and *D. phalaenopsis* were synonymous . . . many people followed his findings. If you were one of those who changed the tag on your **big beautiful** *D. phalaenopsis* to *D. bigibbum* then you were **a very naughty boy** and should have your bottom **spanked,** because you should have changed it to *D. striaenopsis*, which is the new name put forward by Mark for the orchids imported as *D. phalaenopsis* supposedly line bred from species found on the islands in the Timor Sea. **And** if you thought that his findings immediately made Australian hybrids of your *D.* Dalvey, *D.* Suzanne, *D.* David Baver, *D.* Orchidwood, etc., etc., then you are very much mistaken as in reality they are now part of a huge pool of unnamed hybrids. **After all** only the names are supposedly synonymous and not the actual plants. As there has not yet been any registrations accepted with *D. striaenopsis* as a parent (to my knowledge) you would have been far better not to rush changing your tags, after all Mark does state on page 59 of the book *Australian Orchid Research* Vol. 1 in the paragraph referring to *D. phalaenopsis* "further research is underway on this group of species".

There is no law that states you have to follow one botanist or another. At home you can call any of your orchids whatever you choose. However once you decide to bench them at a show then the rules change. If a judge has doubts about the parentage of plants in a section there is a good possibility (after discussion with the other members of the panel) that the plant would be (and should be) ignored.

I personally don't think the variety of *D. bigibbum* known as var. *superbum.* (Syn *D. phalaenopsis*) is even worthy of varietal status. Having been in the position to see at close quarters *D. bigibbum* from the south, west and north of Cooktown in very large numbers it is amazing the variability of the species in quite small areas. Even on the same tree or vine, ones with white splashes in the labellum are growing alongside ones with none and as for the variability in shape and size of labella just look at Alick Dockrill's drawings in his new book (page 593) *Australian Indigenous Orchids,* Vol. 2. There are two very consistent features, however, which make it easy to tell a genuine *D. bigibbum* from a *D. bigibbum* var. **bodgie.** They are the side lobes of the labellum, which on all but one genuine *D. bigibbum* (and that one had a badly distorted flower) I have ever seen, curl over and touch, even overlap, to form a "tunnel" and the long, thin spur at the back of the flower. This feature seems to disappear or change radically with hybridisation.

Bodgie hybrids . . . unfortunately there is also an increase in the number of orchids being benched as Australian native hybrids which are definitely **not** . . . those already mentioned in this article are but a few. Probably the most common are the *D.* Peewee's made by a nursery which used to be at Tambourine Mountain. I have made this hybrid (*D. bigibbum* X *D. tetragonum*) on a number of occasions and can't even come close florally or in plant growth habit to the original ones.

This hybrid was registered in 1979 and supposedly a *D. bigibbum* var. *superbum* subvar. *compactum* was used. Other people have made this cross using *compactum,* report their hybrids rarely attain a height of more than 10 inches (250mm). The original ones attain a height of over **three feet** (900mm), far greater than either of the parents.

Other features of the ones I have made using a combination of *D. bigibbum* and *D. tetragonum.* Narrow pointed labella, with the side lobes either touching or nearly so (as in the 'bigibbum' complex). Quite narrow segments to the flowers, pale pastel shaded colours and thin square canes. The original one has thicker roundish canes, dark flowers with quite broad segments **and** a wide flaring labellum. Some people say the original ones where probably *D.* Suzanne (*D. phalaenopsis* (Syn. *D. striaenopsis*) X *D. tetragonum*)) but I doubt whether this is even the case. Most likely it was a hybrid between a *D. tetragonum* and a complex hybrid *Dendrobium,* something with a *Spathulata* section (like *D. stratiotes*) in its parentage, *D.* Caesar X ? for instance.

Anyone can be guilty of genuine mistakes, a mix-up in flask numbers, using orchids to make hybrids which were wrongly labelled when you bought them. All these things can be corrected if caught in time and admitted, when they are not however, the problem becomes increasingly worse as these "Bodgie" hybrids are used to make more "Bodgies".

If you are unsure about the parentage of some of your plants then check with someone knowledgeable in your society, or bench them as *D.* unknown and let the judges sort it out, if it's good enough it will still win.

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Clements, M.A. (1989). Catalogue of Aust. Orchidaceae, *Aust. Orch. Res.* Vol. 1.

Dockrill, A.W. (1992). *Aust. Indigenous Orchids,* Vol. 2. Surrey Beatty and Sons in association with S.G.A.P.

Orchids referred to are *D. bigibbum* Lindley and its varieties. *D. phalaenopsis* Fitzg. *D. striaenopsis* Clements and *D. tetragonum* Cunn. and its varieties.

[Ed.—Photos submitted by John Mewburn, with his article and the notes made with each are as follows, these notes are too extensive to appear under each photo].

Plate 1 *Dendrobium bigibbum* var. *bigibbum* 'Moa', named after a Torres Strait Island.

Plate 2 *D. phalaenopsis* (bicolor form) Syn. *D. striaenopsis* is probably a complex hybrid.

Plate 3 Hybrid between *D. bigibbum* var. *superbum* 'Red Princess' and *D. bigibbum* var. *bigibbum* 'Moa'. Note side lobes of labellum touching.

Plate 4 Note short fat spur on this imported, supposed *D. phalaenopsis* (Syn. *D. striaenopsis*).

Plate 5 *D. bigibbum* var. *superbum* 'Red Princess' from Princess Charlotte Bay.

Plate 6 Hybrid between *D. bigibbum* var. *superbum* 'Red Princess' and *D. bigibbum* var. *bigibbum.* Note long thin spur.

Plate 7 Note short fat spur on this complex *Phalaenanthe* section *Dendrobium.*

Plate 9 *D.* Peewee made with *D. bigibbum* var. *bigibbum* and *D. tetragonum* var. *hayesianum* (sensu Dockrill, 1969 Aust. Indig. Orchids). Note white patch in labellum.

Plate 10 *D.* Peewee made with *D. bigibbum* var. *superbum* and *D. tetragonum* var. *giganteum.*

Plate 11 *D.* Peewee made with *D. bigibbum* var. *superbum* subvar. *compactum* crossed with *D. tetragonum* var. *giganteum.* Plants rarely attain 10 inches (250mm) in heights. ✤

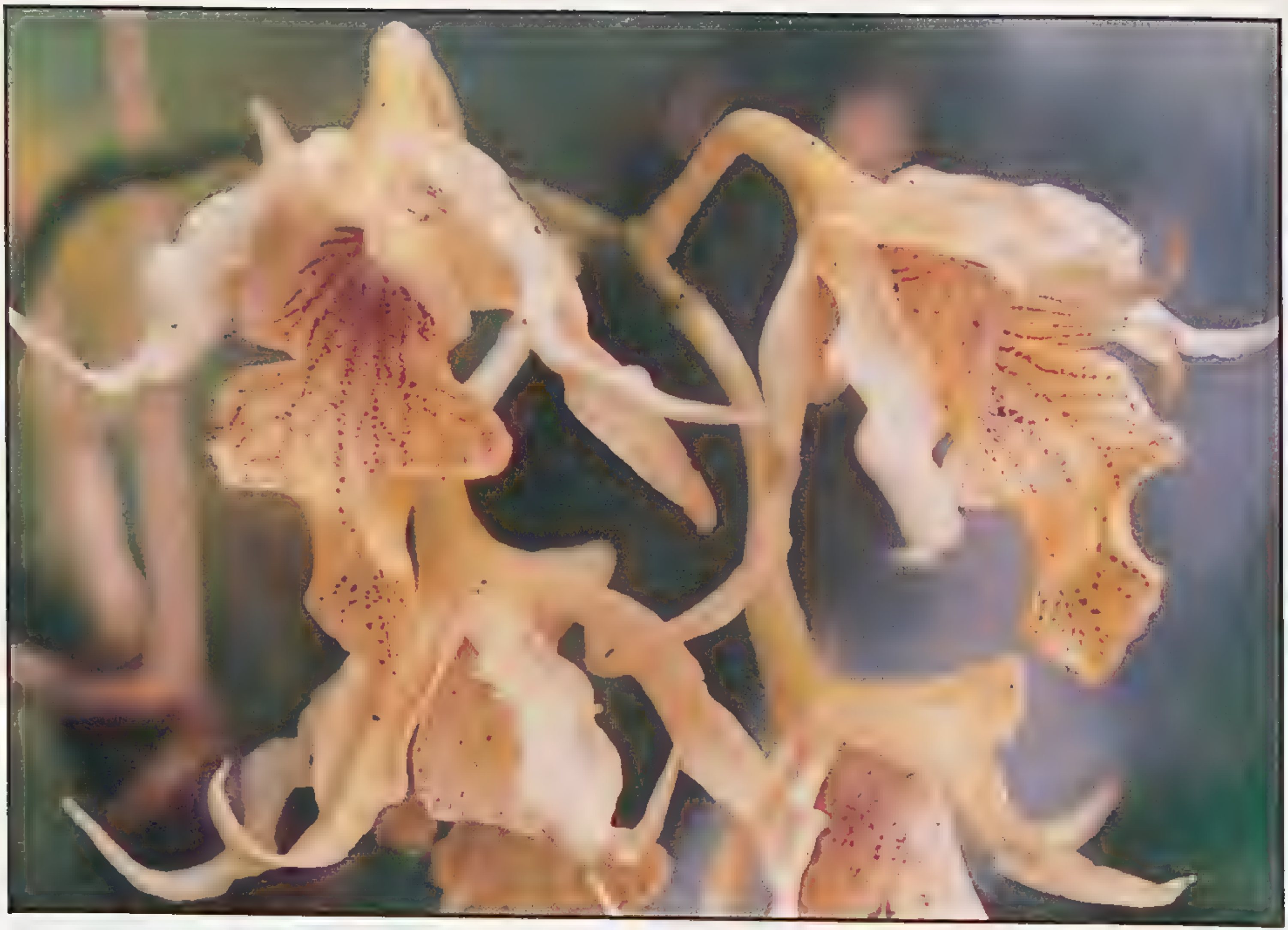

Plate 8: *Dendrobium hodgkinsonii*. Photo: N. Howcroft.

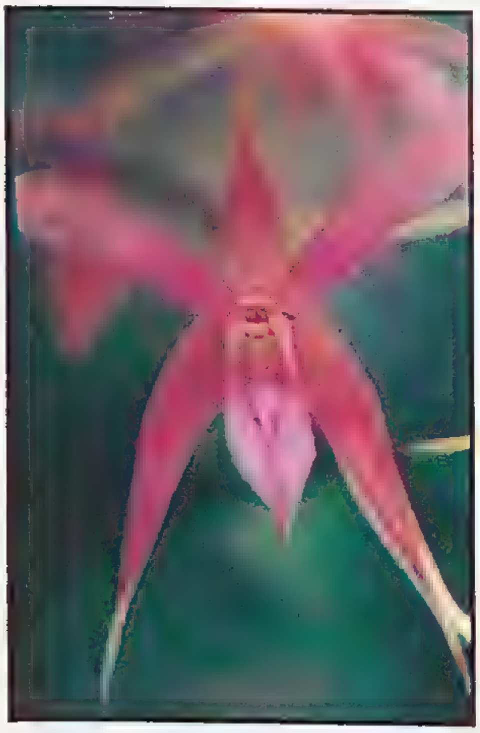

Plate 9: *Dendrobium* Peewee.

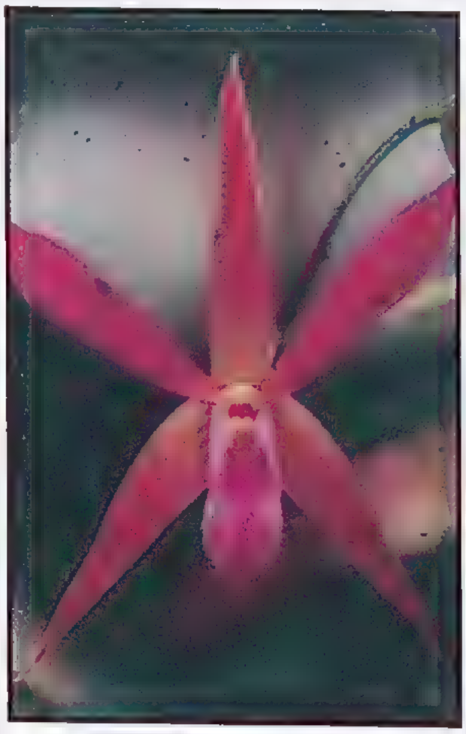

Plate 10: *Dendrobium* Peewee.

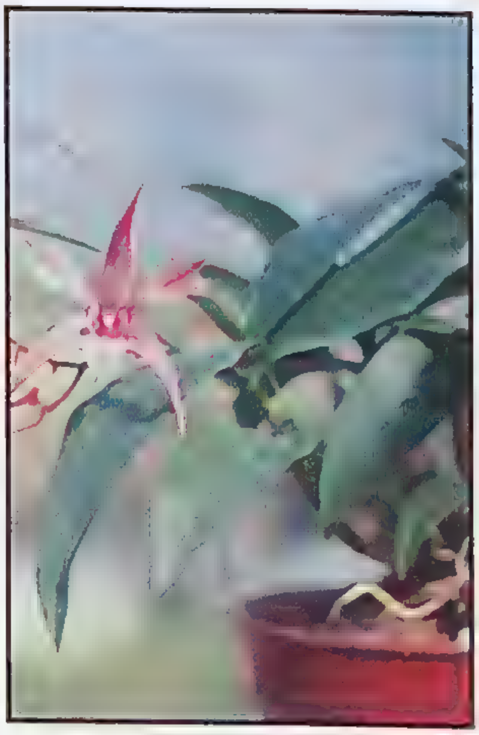

Plate 11: *Dendrobium* Peewee.

Photos: J. Mewburn

DENDROBIUM HODGKINSONII Rolf. — REDISCOVERED

N. H. S. Howcroft
Forest Research Institute,
P.O. Box 314, Lae, P.N.G.

Dendrobium hodgkinsonii was first described by Rolf in 1900. Several plants were introduced into England by Sanders & Co. from New Guinea and acquired by the Royal Botanic Gardens, Kew, where at least one flowered in 1899. Since then no further collections of this species appear to have been made (Cribb, 1983).

However, about 10 years ago I received a plant, with preserved flowers, of a *Latouria Dendrobium* collected on Bougainville by Mr Barry Middlemiss then a resident of Arawa. The plant was similar in appearance to *Dendrobium spectabile* but was less robust and had distinct glaucous leaves. The upper surface especially being covered with a bluish grey waxy sheen.

The plant was taken and grown at my residence at Bulolo where it flowered in its second year of cultivation (Fig. 1, Plate 8). For quite some time this orchid remained unidentified. However, during a literature search in the herbarium's library at the Forest Research Institute at Lae, a photocopy of an article from a *Curtis's Botanical Magazine,* showing an illustration of *D. hodgkinsonii,* was found. The mystery orchid from Bougainville matched the description and illustration of this species.

At least one more plant was found by local friends of Mr Middlemiss before he was evacuated from the island. It appears that the plants were collected only from the mountain regions. This species may not be confined to Bougainville for in 1992 another unflowered plant, matching this species vegetatively, was found in the mountains of East New Britain, at 700m altitude and as an epiphyte. This specimen also possesses glaucous coriaceous leaves. Both the Bougainville and the East New Britain specimens are in cultivation at Lae and are growing well.

Cribb (1983) in his review of the section *Latouria* thought that *Dendrobium hodgkinsonii* might be of hybrid origin. The petals of *D. hodgkinsonii* are similar to *D. spectabile* and the labellum shares some similarities to *D. finisterrae.* Both are known to occur in the Solomon Islands.

DESCRIPTION

Dendrobium hodgkinsonii Rolf. in Curtis's Bot. Mag.: t. (1900); Kew Bull. 1906: 32 (1906).

Epiphytic. **Pseudobulbs** clavate or subclavate, 2–5 noded below leaves, up to 30cm tall, up to 2cm diameter, 2–3 leaves at apex. **Leaves** coriaceous, glaucous, elliptic-ovate to ellipti-lanceolate, acute, up to 15.5cm long to 6cm wide. **Inflorescence** terminal to subterminal, erect or spreading, up to 5 flowers; peduncle and rhachis around 15cm long. **Flowers** large, mostly sub-nutant. **Dorsal sepal** lanceolate, acute, 2.7cm long, 0.5–0.8cm at widest part, glabrous. **Lateral sepals** obliquely lanceolate, acuminate, 2.0–2.6cm long, 0.9–1.3cm at widest part, slightly ridged or keeled; mentum conical, c. 1cm long. **Petals** linear-lanceolate, acuminate, 2.8cm long, 0.4–0.5cm wide, with undulate margins. **Labellum** 3-lobed, flattened 3–3.5cm long, c. 3.3cm between tips of lateral lobes; **lateral lobes** erect to incurved over the column, semi-circular and recurved at apex, **mid-lobe** longer than lateral lobes; ovate, acuminate and recurved toward the apex; **callus** three-ridged, not raised at apex. **Column** short c. 4mm long with acute stelidium on each side of the clinandrium. **Anther** semi-circular and notched on the lower margin.

DISTRIBUTION

Bougainville and possibly New Britain. Cribb (1983) gives East New Guinea as its area of distribution but this may be too broad an estimate of its distribution and can only be confirmed by future collections.

NOTES

Alcohol specimens of this species are lodged at Lae Herbarium under NH745.

ACKNOWLEDGEMENTS

I would like to thank Mr Barry Middlemiss for the specimen of *D. hodgkinsonii* and information regarding its collection locality. I would also like to thank Dr Geoff Stocker, Director of F.R.I. at Lae for his valuable comments on the draft of this article.

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Cribb, P.J. (1983). A revision of *Dendrobium* Sect. *Latouria (Orchidaceae),* Kew Bulletin 38 (2) 254.

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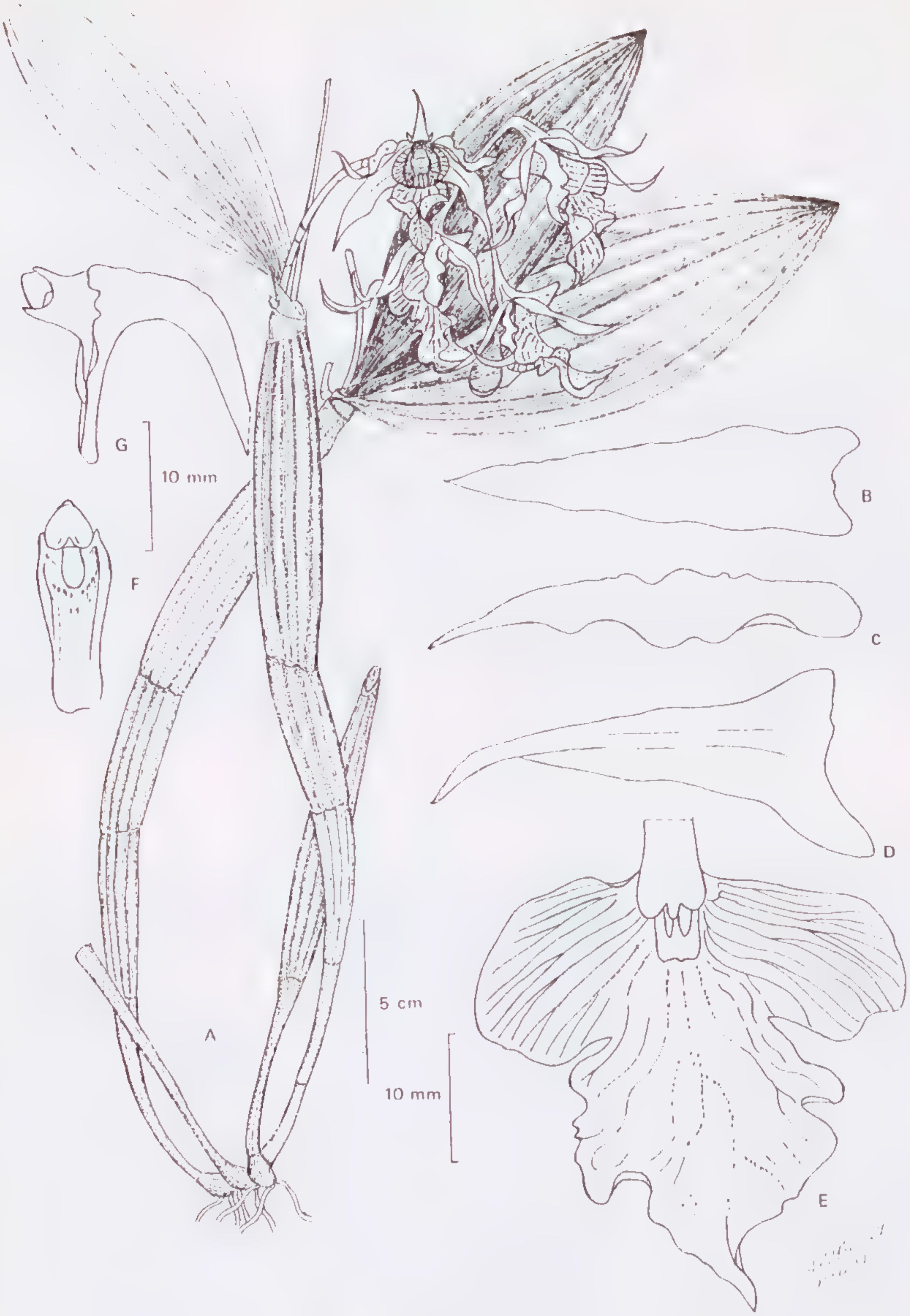


Fig. 1 — *Dendrobium hodgkinsonii*

A. Habit (5cm scale); B. to E. Dorsal sepal, petal, lateral sepal and labellum (10mm scale); F. and G. Column, ventral and lateral view (10mm scale).

FUNGUS GNATS

Alan J. Merriman — Miriam Ann Orchids
89 Levy Street, Glenbrook, N.S.W. 2773
Phone: (047) 39-5141

Over the last couple of years orchid growers have been complaining about their plants not growing. Most of the complaints have come from growers of cattleyas, *Phalaenopsis* and Australian natives and their hybrids.

The usual symptoms are yellowing of the plant's leaves with premature drop. Some leaves seem to twist and look distorted. By this time the plant has very few live roots and the plant looks very sick.

Many growers have brought their sick plants around to see if I could put them on the right track. On removing the plant from the pot one could see small maggot-type grubs in the growing media, these are the larva of the fungus gnat.

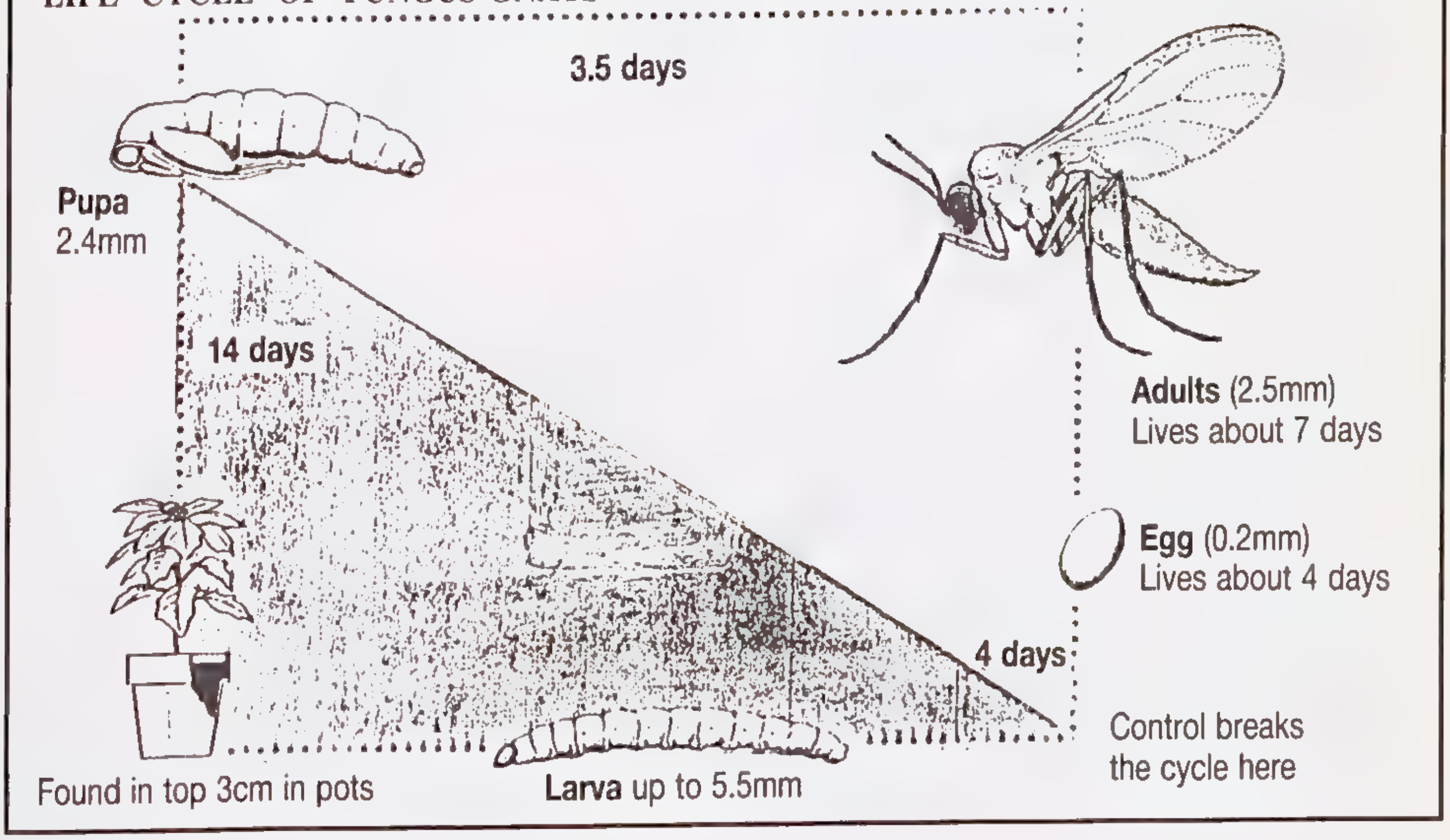
Fungus gnat larvae grow to around 5.5mm long and are a clear colour with a black head. The adult fly is very small at about 2.5mm long and looks like a small mosquito.

The larval stage is where all the damage takes place. They eat the small root ends and burrow into the larger roots. They seem to thrive in peat based media especially if the mix has an organic content. The female gnat lays its eggs in the top of the mix. The eggs are very small and hatch within four or five days. Once the eggs hatch the larvae feed on the orchid roots for 10 to 15 days, then it will enter a pupal stage. The pupal stage lasts for three to four days, then the adult gnat emerges from the pupal case. The adult lives for approximately one week.

If you have a bad infestation you may have to treat your growing area, that is your glasshouse or shadehouse with the appropriate insecticide. This means spraying all plants and under all of the benches in the growing house.

In Judy McMaugh's book: *What Garden Pest or Disease is That*, she suggests the use of Diazinon or Maldison.

If your plants have any of the above symptoms, check the plant roots and place the compost on a clean sheet of paper and inspect carefully for these very small crawlies.



LIFE CYCLE OF FUNGUS GNATS

AUSTRALIAN NATIVE ORCHID HYBRID REGISTRATIONS

(New registrations from lists in *The Orchid Review*, March–August, 1995):–

Name	Parentage	Registered by
Dendrobium		
Amber Banks	Sunglow X *speciosum*	D. Banks
Anne's Rainbow Surprise	Colonial Surprise X *speciosum*	Florafest (I. Klein)
Awesome	Lustrous X *speciosum*	N. Finch
Barry Simpson	Brinawa Charm X *speciosum*	N. Finch
Beast	Peewee X Tweed	N. Finch (N. Roper)
Gold Dollar	Golden Grace X Whitehart	Florafest (I. Klein)
Golden Maron	Maron X Golden Glory	Florafest
Graham Gold	Graham Hewitt X Star of Gold	I. Klein
Hanamori Joy	Berry X *phalaenopsis*	M. Morita
Jannine Banks	Hilda Poxon X Ellen	D. Banks
June Mac	Yondi X Zip	N. Finch (J. McMillan)
Kathking	*kingianum* X Kathryn Banks	N. Finch
Katrina Ann	David Baver X *tetragonum*	G. Rex
Leon Young	Maron X *tetragonum*	Florafest
Natasha Mary	Lynette Banks X King Falcon	G. Leafberg
Orchid Song	Berry X Specio-kingianum	H. S. Song
Ray's Pride	Aussie Treat X Ellen	N. Finch (Ray Hill)
Rose Bay	*gracilicaule* X *canaliculatum*	P. Sourrys
Rutherford Bluetongue	Bicentennial Rose X *kingianum*	T. J. Smith
Rutherford Galaxy	Pinterry X Ellen	T. J. Smith
Rutherford Starburst	Zip X Pauline Rankin	T. J. Smith
Rutherford Sunburst	Yondi X Rutherford Surprise	T. J. Smith
Rutherford Sunspot	Bicentennial Rose X Ellen	T. J. Smith
Shepherd's Sunset	Lorikeet X Aussie Glow	I. Klein
Tannock	Susan X *fleckeri*	I. Klein
Winter Delight	Montaken X Merritt Island	T. Vajrabhaya
Zinger	Zip X *tetragonum*	R. Clement
Diuris		
Dragonfly	*drummondii* X *punctata*	G. Nieuwenhoven
Plectochilus		
Lynore	*Sarcochilus* Mavis X *Plectorrhiza tridentata*	W. T. Upton
Pterostylis		
Dusky Duke	*pedunculata* X *curta*	D. Barnham
Sarcochilus		
Burgundy On Ice	Judith X Fitzhart	Florafest
Cream Cake	Marion X *hartmannii*	W. T. Upton
Cyclone	*falcatus* X *olivaceus*	Riviera (G. Hicks)
Gowrie Sunset	Judith X *fitzgeraldii*	Florafest
Jake Simpson	Fitzhart X Elizabeth	Simpson Orchids
Noreen	Arcadia X Lois	Simpson
Roy Gill	Melba X Heidi	B. Gregory
Wilde Rose	*roseus* X *fitzgeraldii*	J. Lattimore

NOTES ON THE CULTIVATION OF *CORYBAS* — THE "HELMET ORCHIDS"

David P. Banks
Hills District Orchids
39 Carole Street,
Seven Hills, N.S.W. 2147

The terrestrial genus *Corybas* consists of about 100 species. Various taxa occur from northern India, throughout South-East Asia, the Pacific Islands to Australia and New Zealand. Many of the exotic species occur in moist mountainous areas in montane forest, often in association with *Sphagnum* moss. It is worth noting that close to 50 species occur in New Guinea, large numbers at Mount Kinabalu-Sabah. Ben Wallace recently informed me that there are many undescribed taxa in New Caledonia.

In Australia, there are at present 22 species described, this number is likely to increase slightly as there are still a number of taxon under revision, primarily by well known and prolific writer, Australian National Botanical Gardens botanist — David Jones.

There have already been two books published covering many of the *Corybas* species. These are: *The Genus* Corybas (Orchidaceae) *in its Eastern Areas* by P. van Royen (1983) which deals with the species found east of the so-called "Wallace Line" and Corybas *West of Wallace's Line* by John Dransfield et. al. (1986).

Over the years I have grown quite a few species, but never had a great deal of success in flowering them or getting the plants to satisfactorily multiply. The flowers do not like variations in humidity and will quickly collapse if the atmosphere becomes too dry. A number of growers have used terrariums with varied success, but are often difficult to view in this manner.

I actually finished up by giving them away for other growers to try and thus end my frustration! That was about 10 years ago.

However, I feel I may have fallen to their strange charm a second time round. Well known botanical artist and terrestrial orchid grower, John Riley, showed me quite a collection of superbly grown and flowered examples recently. John insists that they are quite easy to cultivate, flower and multiply if their basic requirements are met. The two most important aspects being humidity and coolness.

I have spent quite a few hours (and rolls of film!) at Johns' over the years and he has kindly allowed me to pass on his knowledge regarding the cultivation of these unique ground orchids.

POTTING MIX

John basically uses the same mix for most of his deciduous terrestrials. He says it's important to repot into fresh mix annually or at least every two years to maintain the vigour of the plants.

The John Riley terrestrial mix is as follows:–

- 2 parts of course sand (or fine gravel) 2mm–5mm size
- 1 part sieved decomposing leaf litter, parts less than 12mm in size
- 1 part hardwood *(Eucalyptus)* shavings, kept moist for two months before using
- 1 part good garden loam.

The only additives are a handful each of blood and bone and dolomite to 10 litres of the above mix.

John makes up this mix a few weeks before repotting takes place, which is obviously when the plants are dormant. He pots the plump but small tuberoids, about 30mm deep, into a moist medium. The mix is kept just damp until the plants start to emerge from dormancy.

Corybas buds are protected within the rolled-up leaf as it emerges from dormancy. So you know almost straight away the potential for flowers. At this stage John places the clear "Chinese food containers" over the 115mm pots, which fit quite snugly. As this acts with the same principles as a terrarium, little extra water has to be given to the plants. After flowering these containers are then removed. Only water if mix is going dry as too much water may lead to leaf or collar rot.

John grows his *Corybas* in the shadehouse under 50% shade, but they must be in a cool spot away from drying winds and the direct sun. John even grows a few under the bench.

After flowering, keep the plants "green" for as long as possible before they go dormant. If allowed to dry out prematurely, only the original tuberoid will be replaced. If dormancy can be put off until November, it gives the plants' stolons enough time to produce a number of daughter tuberoids for next season. This is the key to propagating these orchids. Some of the hardier species to try are *C. fimbriatus*, *C. aconitiflorus* and *C. pruinosus*.

I would like to sincerely thank John Riley for sharing his vast knowledge with me and allowing me to photograph his plants for *The Orchadian.*

Plates 14 to 18 are from plants in John Riley's collection.

Plates 12 and 13 are plants in situ.

MARK CLEMENTS TO SPEAK AT AUSTRALASIAN NATIVE ORCHID SOCIETY SYDNEY GROUP

On Saturday, 9th September, Australasian Native Orchid Society Sydney Group will host a special lecture by Mark Clements from the National Botanic Gardens, Canberra.

Commencing at 7.30 p.m., "An Update On The Taxonomy Of Australian Native Orchids" will see Mark discuss recent name changes and explain the reasons for and the philosophy behind these changes.

The entry fee of $4.00 will also include entry to the Australasian Native Orchid Society Sydney Group Spring Show from 6.00 p.m. A light supper will be provided and all visitors are welcome.

The venue is Baulkham Hills Community Centre. Entry to the car park is via Conie Avenue, off Seven Hills Road.

I LIKE *BULBOPHYLLUM BRACTEATUM*

Jean Deane
Wahroonga, N.S.W

In my opinion this *Bulbophyllum* species is one of the most delightful of the Australian bulbophyllums. It's a bit different and of course, I like plants that are different!

Bulbophyllum bracteatum has hard, knobbly green pseudobulbs, up to 12mm in diameter, which grow right next to one another, like a chain of green beads, old plants ramble for a considerable distance before the oldest pseudobulbs, by then, brown and hard, finally die. The newer pseudobulbs are topped with a single oval leathery leaf which drops off after three or four years.

Each year, just in time for the spring shows, they come into full flower. In actual fact you can get some idea of how many racemes there are going to be quite early in winter, as the flower stems show up in late autumn and gradually lengthen over winter until they are about 10cm long with quite noticeable grey bracts along them. Then it is a case of patiently waiting until the flower buds finally decide that spring has come and it is time to open.

They appear from within the pointed bracts on very short pedicels and spread widely open to become 6mm or more across. The flowers vary considerably in colour, the wide sepals show off the varying amounts of rich, deep red mottling on a cream background. Have a look at the flowers under a 10X lens they're gorgeous. The petals are much narrower than the wide sepals and the lip is like a thick yellow tongue. The flowers last quite well. As there are usually at least a dozen flowers and sometimes up to 20 or more close together on the upper parts of the stem the lovely miniature show is worth waiting for and lasts for two to three weeks, depending on how warm it gets.

I find this *Bulbophyllum* grows well on hard tree fern *(Cyathea)* slabs, they seem to grow larger pseudobulbs and therefore flower better than plants on hardwood or cork. Perhaps in the Sydney region the tree fern provides just that little extra moisture during the hot summer for this species actually comes from the northern New South Wales and southern Queensland ranges and is not a tropical species. I must admit I keep my plants in quite a lot of light at all times and grow them outside, up high under 50% shadecloth, for most of the year but bring them in under fibreglass, where they don't get too cold, during our winter frost period.

I find they require quite a lot of moisture during all warm weather but rather less in the cold periods.

Bulbophyllum bracteatum is certainly one of our loveliest, small flowered bulbophyllums. If you don't have any, keep a lookout for them on show sales tables.

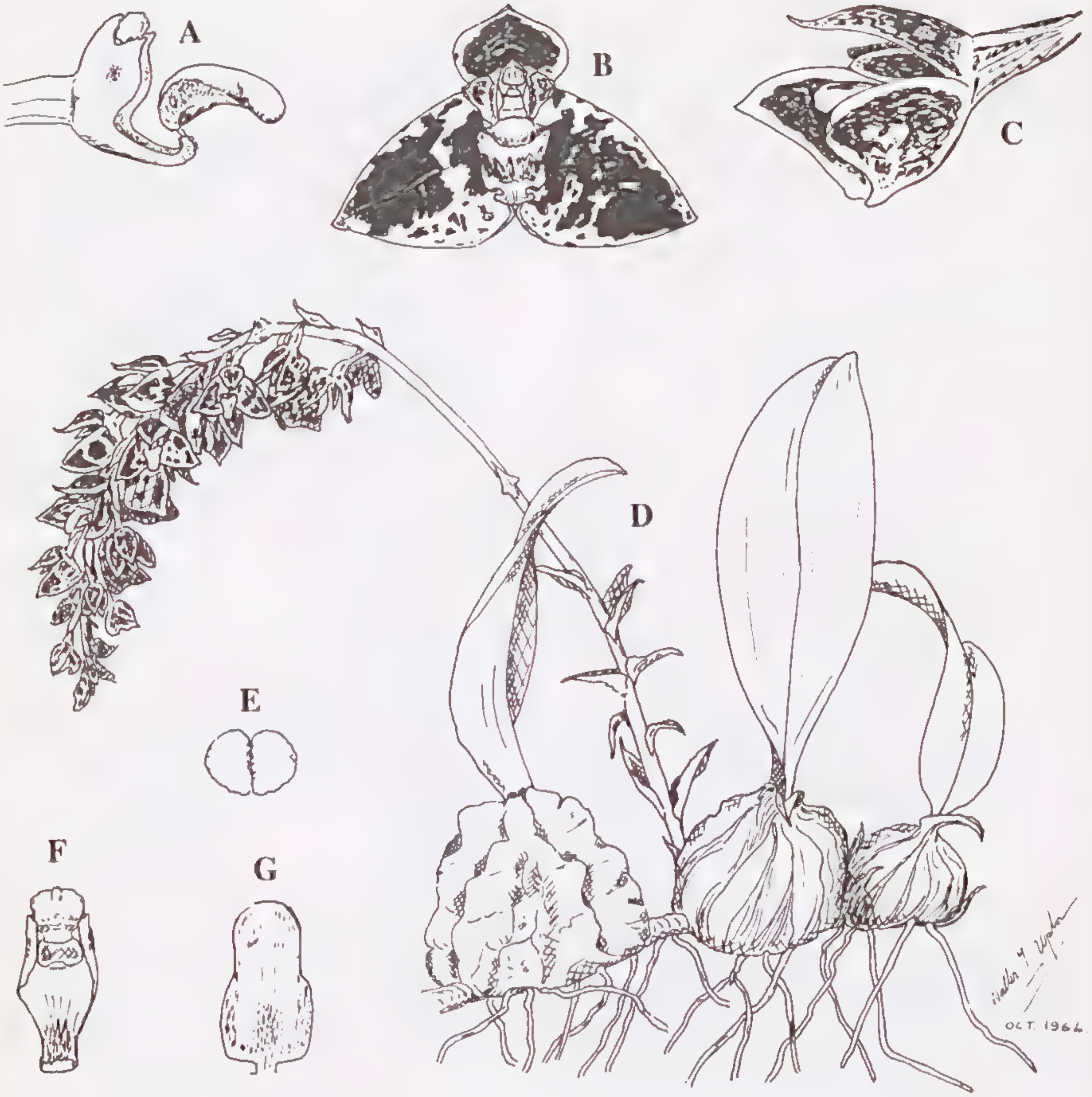
If you do have plants and don't flower them well chances are they need more light for they are at times found with *Dendrobium speciosum!*

As an extra bonus it has grey banana-shaped seed capsules. ✾

Australasian Native Orchid Society Newcastle Group will be conducting a Native Orchid *(Sarcanthinae)* Show on 14th–15th October, 1995 at the Hunter Region Botanic Gardens, Pacific Highway, Motto Farm. The gardens are located 4km north of Hexham bridge toward Raymond Terrace.

Schedules available — phone (049) 57-6538.

Two native orchid nurseries will be in attendance. ✾



Bulbophyllum bracteatum F. M. Bail.

MacPherson Range

A.	Column and labellum, side view	6X
B.	Flower, front view	6X
C.	Flower, side view	6X
D.	Plant	2X
E.	Pollinia	approx. 20X
F.	Column, front view	8X
G.	Labellum, view from above	8X

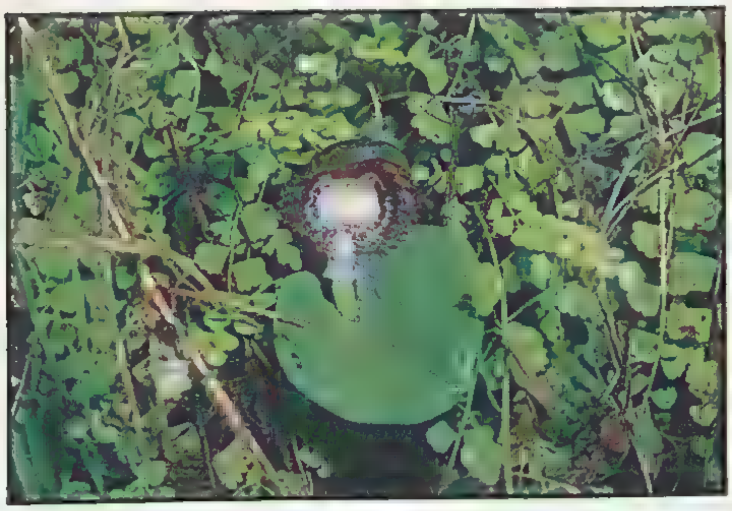


Plate 12: *Corybas diemenicus*. Belair National Park. Photo: W. T. Upton.

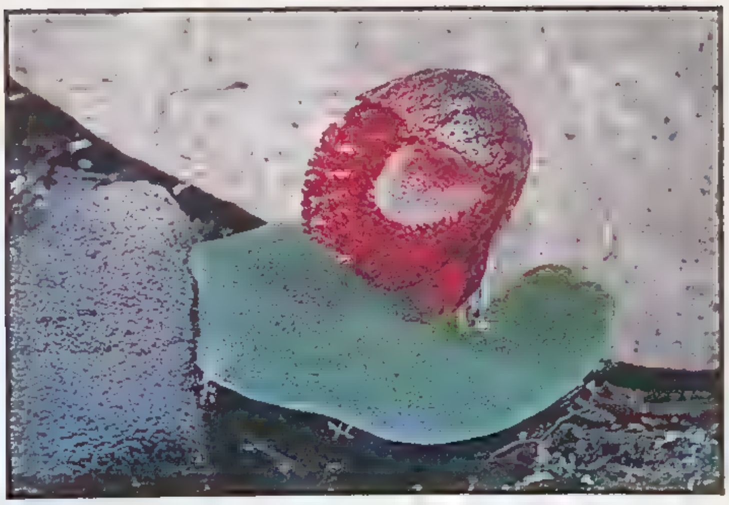


Plate 13: *Corybas undulatus*. Terry Hills. Photo: C. Bower.

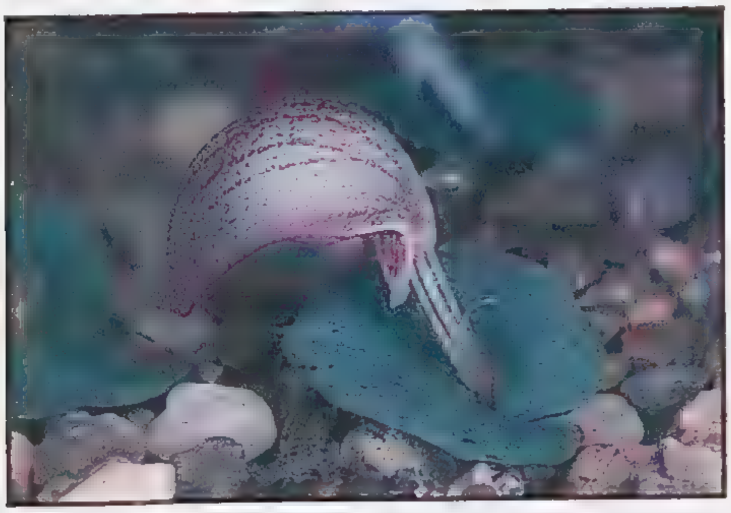


Plate 14: *Corybas aconitiflorus*. Bago. Photo: D. Banks.

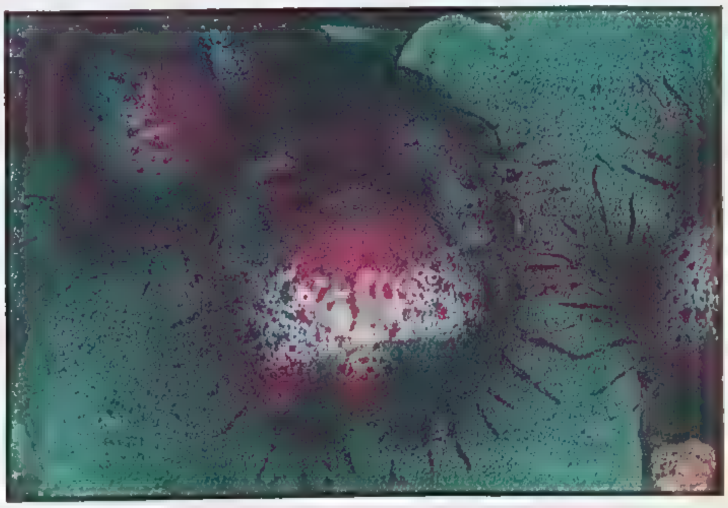


Plate 15: *Corybas fimbriatus*. Betka River, Victoria. Photo: D. Banks.

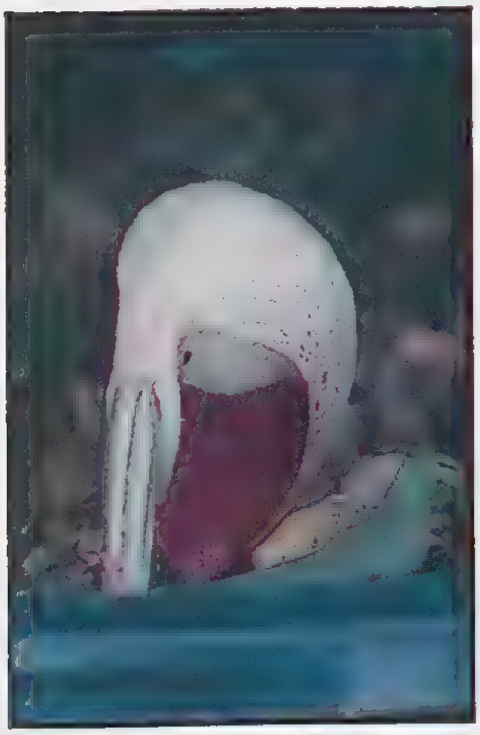


Plate 16: *Corybas barbarae*. Dungog. Photo: D. Banks.

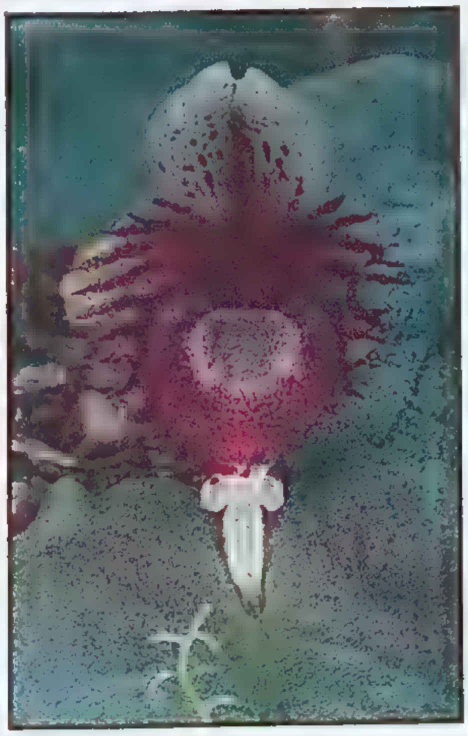


Plate 17: *Corybas pruinosus*. Taree. Photo: D. Banks.

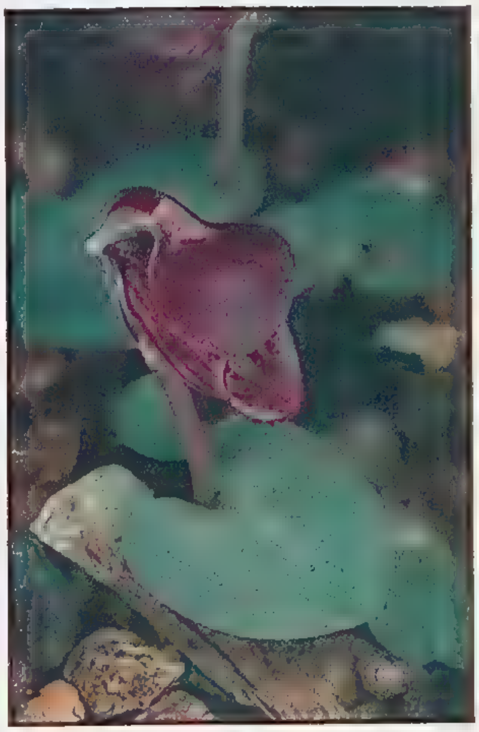


Plate 18: *Corybas unguiculatus*. Anna Bay. Photo: D. Banks.

NOTES ON THE CULTIVATION OF SOME NEW GUINEA SPECIES

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It has been obvious to me for some time that there has been a marked increase in the interest in the orchids of New Guinea and other Pacific Islands. There have always been sections on the showbench for Australasian species but only the odd common P.N.G. species such as *Dendrobium macrophyllum, D. polysema* or *D. helix* or a lone *D. subclausum* (*D. phlox* or *D. flammula* to use some of the names that have been used for this species) were generally shown. There are now a wide variety of species and genera making their appearance indicating the rising interest in these plants. It is not uncommon to have to judge the section when it contains such disparate genera as *Bulbophyllum, Mediocalcar, Paphiopedilum, Spathoglottis, Diplocaulobium, Cadetia* and the wonderfully different sections within *Dendrobium* such as *Spatulata, Latouria, Calyptrochilus, Pedilonum* and *Oxyglossum*.

Species are slowly becoming available as a small number of nurseries add them to their catalogues. I would venture that there are now more species available than in any other time in Australasian Native Orchid Society history as the flasking of Australasian species increases. The ban on export of any further live material from Papua New Guinea has certainly stimulated these efforts as no longer can the enthusiast rely on obtaining wild collected stock.

Nursery raised seedlings are certainly easier to cultivate than bush collected material as they don't suffer the shocks of collection, packaging, air travel and often unsympathetic quarantine.

The difficulty still remains though, of discovering reliable cultivation information on nearly all of the Australasian species. The dedicated grower can infer some information by studying often meagre habitat information scattered through the small number of books dealing with this group of species. For *Dendrobium* species, the monographs by Cribb on the "Antelope" Dendrobiums (1986) and Section *Latouria* (1983) are useful as is the revision of Section *Oxyglossum* by Reeve and Woods (1989). Information on bulbophyllums is very scarce. The only data readily available are the articles by Howcroft and Cruttwell, as published from time to time in *The Orchadian*.

Regional accounts of orchid flora from some of the Pacific Islands, e.g. Vanuatu (Lewis & Cribb, 1989), The Solomons and Bougainville (Lewis & Cribb, 1991), Fiji (Kores, 1989) and New Caledonia (Hallé, 1977, the text is French but at least the drawings are in English!) can also give up some information useful to the cultivator.

I have now grown quite a number of New Guinea and Pacific Island species to maturity. The following notes are intended to guide the grower new to Australasian species into the cultivation of some easy and satisfying species. A glasshouse is not necessary, provided some fundamental needs of the species are understood. some New Guinea species, such as *D. vexillarius* (Plate 27), can inhabit zones up to 4,000m (Reeve & Woods, 1989) so a heated glasshouse would just about be a death sentence for these plants. If you can obtain the stock it is a good idea to experiment with your plants in different situations within your structures. I have learnt some significant information by comparing results of species grown in my relatively warm and well-lit glasshouse to those grown by David Banks in his glasshouse which is cooler, with a higher humidity and more shade. Such co-operative efforts are very helpful in identifying that certain niche in which cultivated plants will do best.

My glasshouse is not large, only 8' x 12' with 7' walls and a high gable. The long axis is oriented north-south with the door in the southern wall so as to gain maximum space in the well-lit end.

It is kept at a minimum of 13° Celsius in winter by a simple room heater controlled by an external thermostat. An automatic watering system damps down the floor periodically overnight so that the humidity does not drop dangerously given the drying effect on the air of this type of heater. I don't generally use shadecloth in summer although I threw some over the house last December the day after the ambient temperature reached 49°! It will come off about Easter. The roof is a double-skinned rigid plastic Nylex product constructed a lot like corrugated cardboard.

All the windows, about 40% of the side wall area, are open all summer and a rotating 24" fan is on all the time. I have traded the fact that the odd bug gets in and munches something for high ventilation. I used to run an evaporative cooler but ceased after the last one broke down under the load. I thought that the high internal temperature reached with the glasshouse closed up so that the cooler could run, combined with the very high relative humidity was not to the liking of many of the plants. I now rely on good ventilation and the automatic watering system misting two or three times a day for reducing the temperatures to manageable levels. It's much cheaper now as the only cost is to run the heater and the fan.

The gable space is occupied by a number of *D. canaliculatum, D. dicuphum (D. affine), D. trilamellatum* and other tropical species that like warm and high light environments. A neat trick as these plants and their totems provide good shade for the plants down on the next level on the bench and those hung at eye level. You can be quite clever with growing a range of orchids in your glasshouse by proper placement of species with differing requirements.

In mine, the smaller tropical species are in the gable as described. The taller hardcanes are on the bench at the front where the light is high and the warmth comes through the glass at the front. *Paphiopedilum* species occupy much of the bench space at hip height down the sides. Also there are most of the *Dendrobium* Section *Latouria* species, such as *D. otoguroanum, D. alexandrae* (Plate 25), *D. eximium, D. cruttwellii* (one is in the shadehouse all year to compare growth) and *D. convolutum.* The more robust Section *Latouria* species such as *D. macrophyllum, D. polysema, D. finisterrae* (Plate 26) and *D. forbesii* are placed more to the front of the house as they seem to prefer reasonable light rather than mostly shade.

The back of the glasshouse has therefore been manipulated so that it is a haven for the cooler growing species, including most of the diplocaulobiums, *Sarcanthinae* species, bulbophyllums, cadetias, etc. It can be real hard to find just the right spot for a high light loving, but cool growing orchid, in a mixed collection. Fortunately most species are reasonably tolerant so, for the moment and until a purpose-built structure can be erected, these types of species get the temperature that they need but miss out a bit on light. They grow alright but don't flower that well. Besides, a drop in light intensity won't kill them but exposure to high light and low humidity will.

The space below the bench is not wasted as in this position I hang most of the bulbophyllums in the collection. Some, like *Bulbophyllum nasica* (Plate 23) and *B. fritillariiflorum,* do terrifically well down there growing rapidly and flowering regularly. Unfortunately, some grow rapidly and flower wretchedly. These species, such as

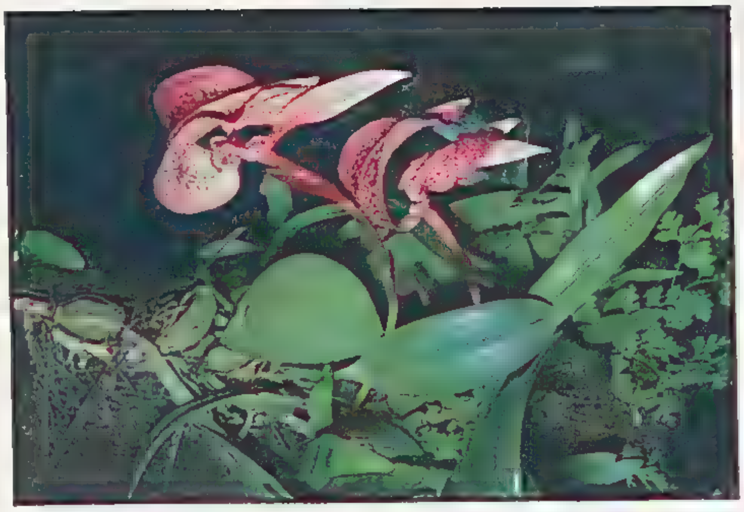

Plate 19: *Bulbophyllum fritillariiflorum.*
Photo: D. Titmuss.

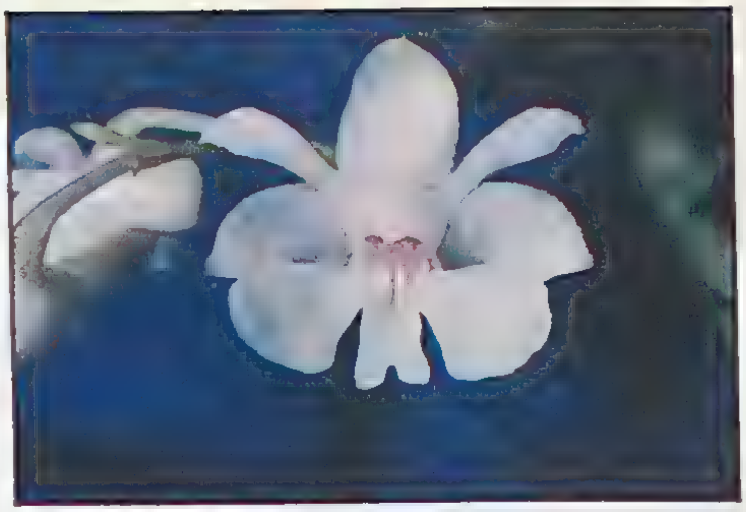

Plate 20: *Dendrobium aberrans.* Photo: D. Titmuss.

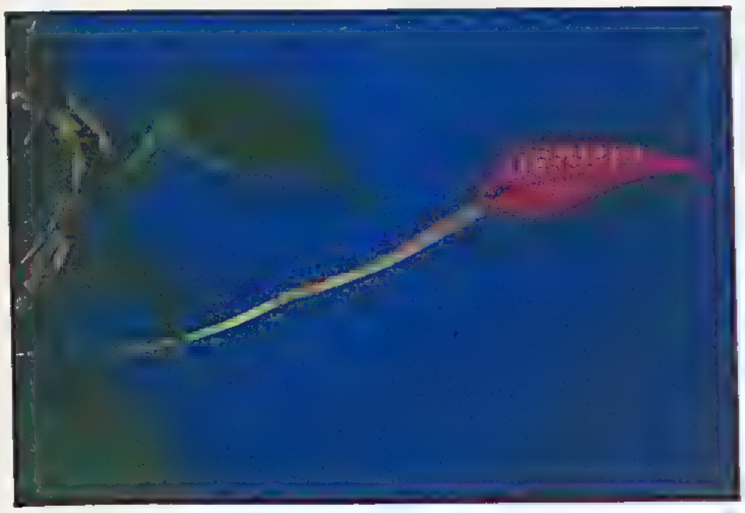

Plate 21: *Bulbophyllum arfakianum.*
Photo: D. Titmuss.

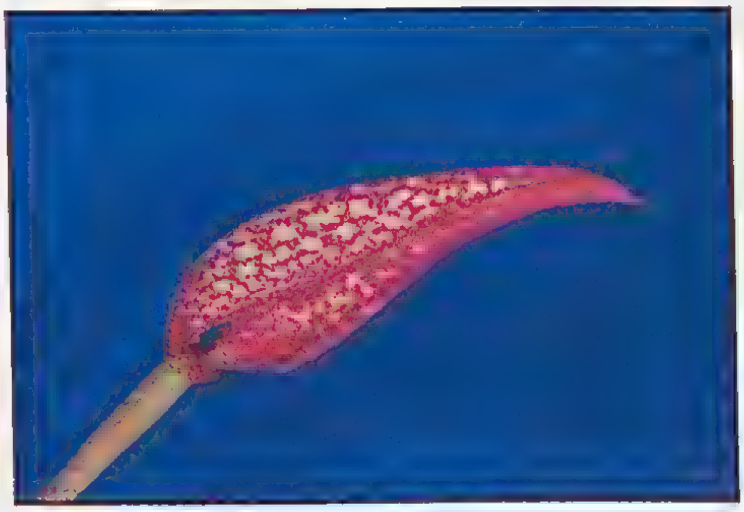

Plate 22: *Bulbophyllum arfakianum.*
Photo: D. Titmuss.

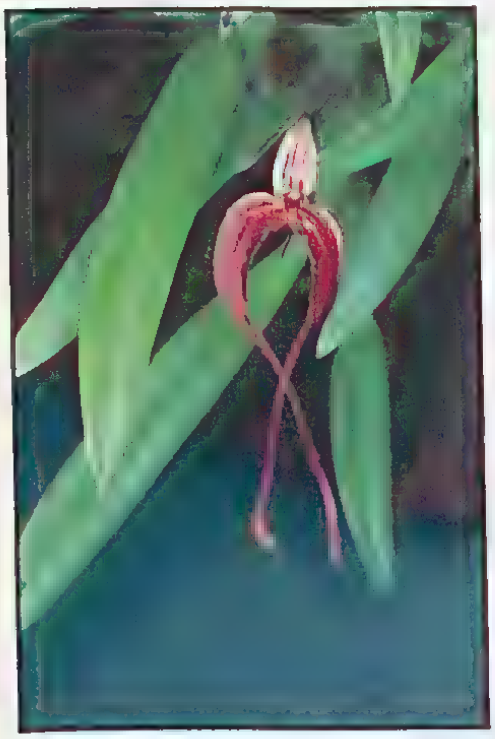

Plate 23: *Bulbophyllum nasica.*
Photo: D. Titmuss.

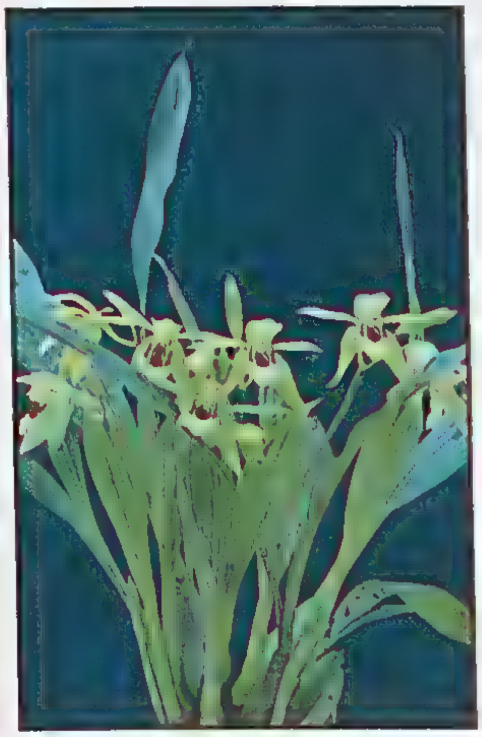

Plate 24: *Coelogyne fragrans.*
Photo: D. Titmuss.

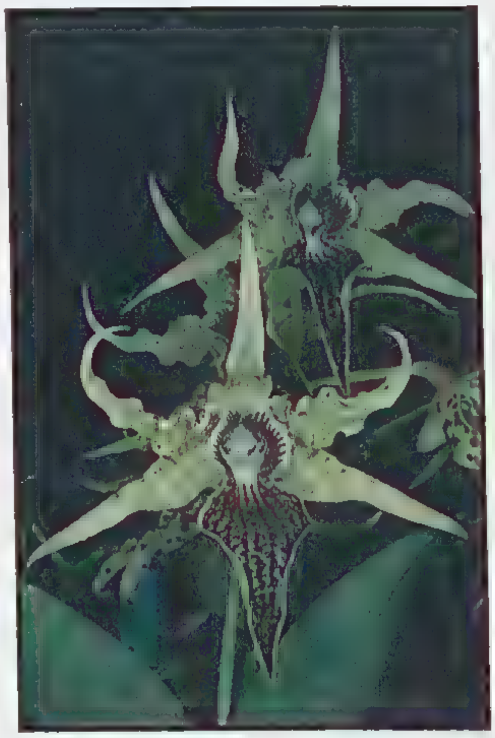

Plate 25: *Dendrobium alexandrae.*
Growers: P. & A. Spence.
Photo: D. Titmuss.

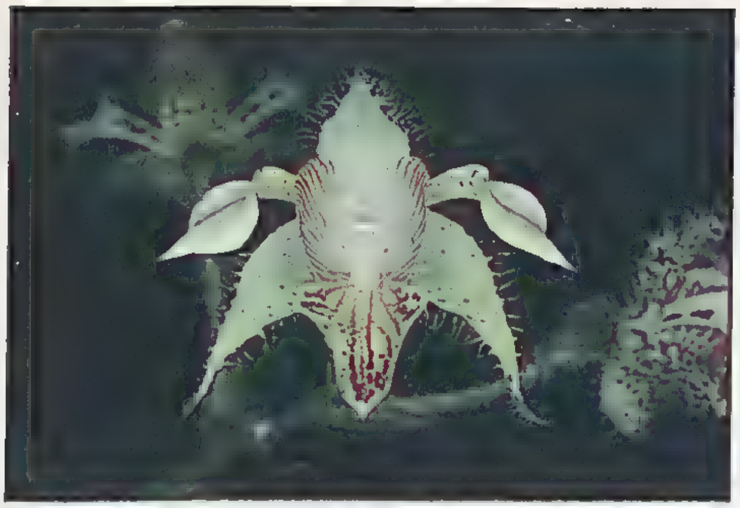

Plate 26: *Dendrobium finisterrae.*
Grower: M. Harrison. Photo: D. Banks.

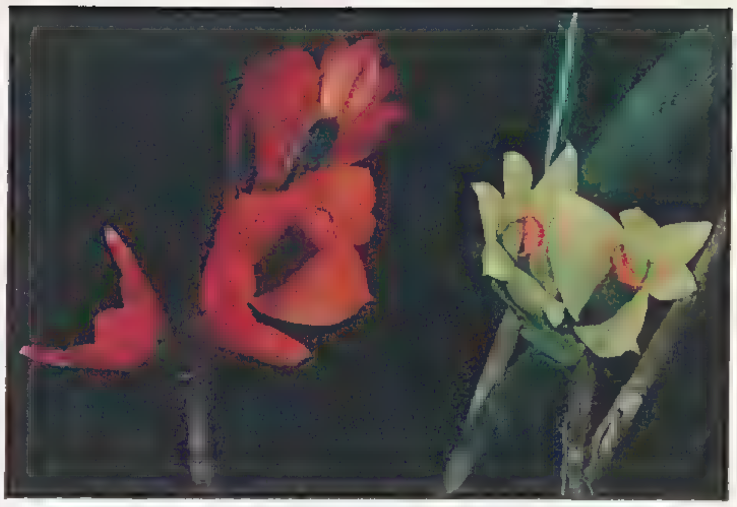

Plate 27: *Dendrobium vexillarius.*
Growers: P. & A. Spence. Photo: D. Titmuss.

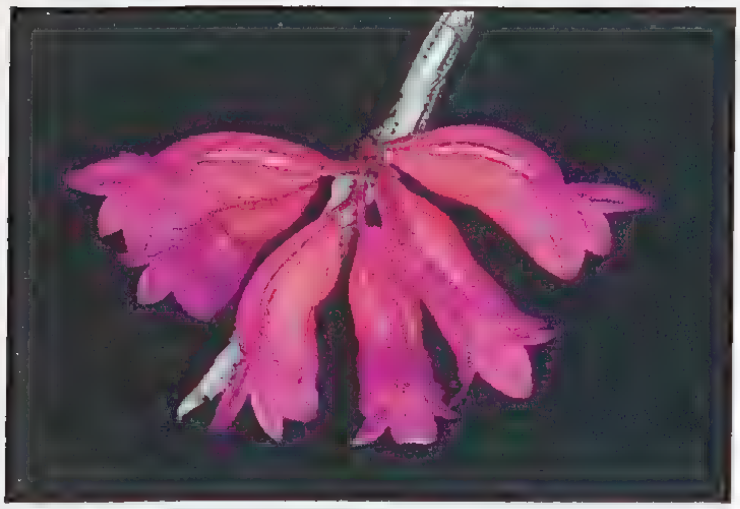

Plate 28: *Dendrobium lawesii* 'Kaleidoscope'.
Grower: D. Banks. Photo: D. Banks.

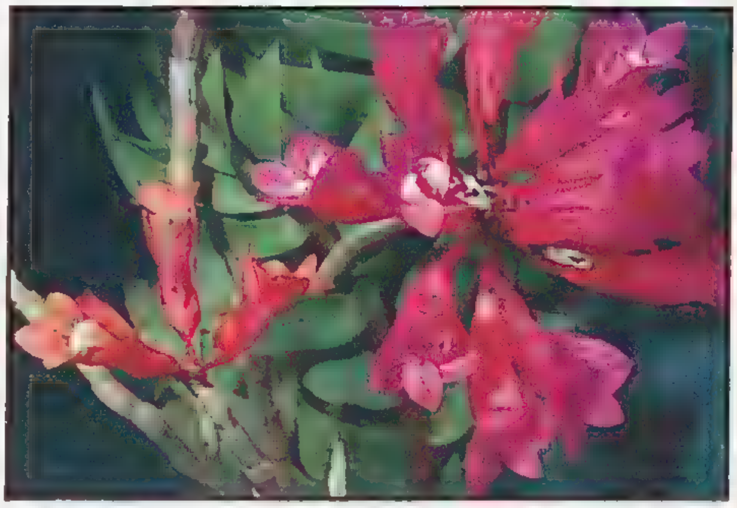

Plate 29: *Dendrobium lawesii.* Two clones.
Photo: D. Titmuss.

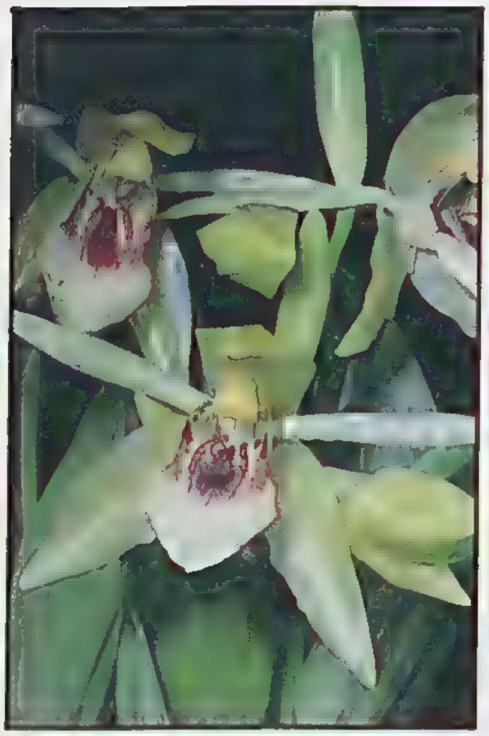

Plate 30: *Coelogyne fragrans.*
Photo: D. Titmuss.

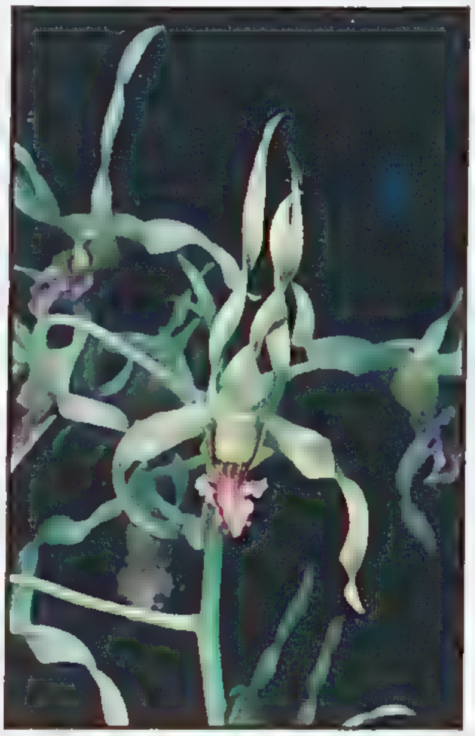

Plate 31: *Dendrobium crispilinguum.* Photo: D. Titmuss.

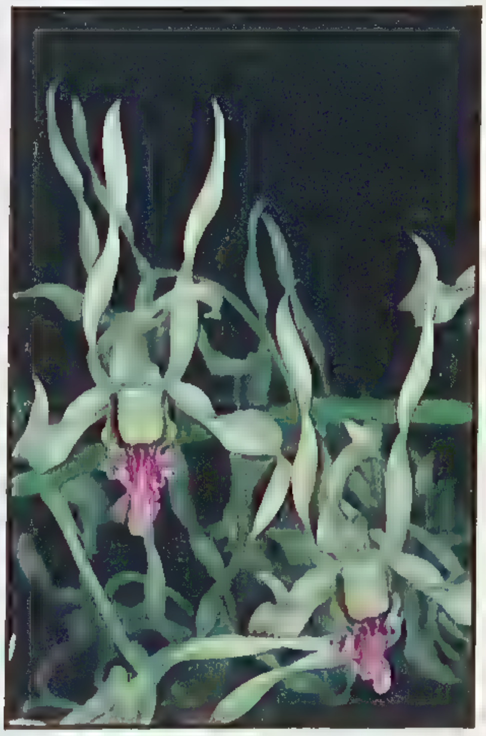

Plate 32: *Dendrobium crispilinguum.* Photo: D. Banks.

B. tollenoniferum, *B. tortum* and *B. masdevalliaceum* would probably flower if they received more light. Sad to say but they're not going to get it at the moment because there just "ain't no room" for these robust plants upstairs. When the new glasshouse comes everybody can have what they like. Have you heard about Rule One of glasshouse culture? Build it twice as big as you think you need it and then it will be only half as big as you require.

There is a very low bench at the front as well where some of the lowland but "non-high-light" plants live. *Coelogyne fragrans* (Plate 24 and 30), *Bulbophyllum graveolens, Eria* species and our own *Phaius pictus* and *Malaxis* species do well there.

My shadehouse has been described previously, see Smedley (1992). Most of the more robust *Dendrobium* species are moved out there during the summer months and generally returned to the glasshouse by the end of March, sometimes a little later if autumn is warm. Once you get a few nights in a row bottoming at 10° it is time to make the move. Outside the plants are refreshed by rainwater, growths are stronger with the higher light, they are better ventilated and any flowers produced in the period have a greater intensity of colour, no doubt induced by the greater exposure to ultraviolet rays. The species that overwinter in the shadehouse are generally placed in their pots on trays half-filled with a pebble and sphagnum moss mixture. This mix is kept moist which helps to raise the humidity around the plants when the ambient humidity is low.

Now to some species accounts.

Dendrobium lawesii (Plate 28 and 29)

This species is one of the easiest New Guinea species to cultivate in a glasshouse or shadehouse as far south as Sydney. Like the ever-popular and desirable *D. cuthbertsonii,* it comes in a wide variety of colours. The most common appears to be red but in a number of shades. It also occurs in orange, yellow, purple, pink, blue(ish), a sort of tangerine and even white. Next comes the bicolours. I have seen red with purple distal parts, pink and white, orange with a purple ovary and orange with a pink wash. No doubt there are others.

D. lawesii has a relatively fine root system so the potting media should not be on the course side. A seedling grade mix of bark and pebble in the ratio of 4:1 has been used satisfactorily for many years. A curiosity of this species, as with others in the Section *Calyptrochilus,* is that the root tips are orange rather than green as in most other members of the Family *Orchidaceae.*

I have used both plastic and terracotta pots with *D. lawesii.* I don't think there is much difference apart from the plastic keeping the mix moister longer, a slight advantage with this species. Of one thing I am certain, *D. lawesii* does not need to be repotted with any great frequency. In fact, some of the first plants I obtained, over eight years ago, are still in their original 50mm thumb pots. The plants have almost climbed out of the pots and moss has developed on the surface of the media and exposed root system but they still grow well. The pseudobulbous stems of the plants in these pots have grown to great lengths, 80cm is the longest, so they have certainly done exceedingly well when the root system is confined.

The species does not require a high level of light being happiest in a spot that could best be described as moderate shade. It even grows quite well when placed under a bench where light level and air movement are at their poorest in a glasshouse.

D. lawesii generally flowers off the deciduous pseudobulbs for some years, although in well-cultivated specimens flowering can occur on the distal portion of the pseudobulb when it is still leafy. Peak flowering occurs in the autumn then into winter and again in spring but in a collection there always seems to be at least one plant in flower.

It will grow quite happily in a Sydney shadehouse all year round if not allowed to dry out too much in winter. Flowering seems to be delayed outside when compared to its cousins in the glasshouse. The outside plants are shy to flower in the autumn and the inflorescences do not develop until later. The flowers develop in clusters along the pseudobulb and last about 6–8 weeks. A shorter flowering period can be expected if the plants are exposed to moderately high levels of light.

Dendrobium crispilinguum (Plates 31 and 32)

This species is one of a group of three higher altitude species of antelope orchids in the Section *Spatulata.* The others are *D. magistratus* and *D. hamiferum.* It is a relatively recently named species having been described in this journal in 1980 by Cribb (1980) from material collected from the Eastern Highlands districts of Papua New Guinea. The altitudinal range of the species is given as from 1,100–1,450m.

From this altitude a degree of cold tolerance could be expected. So, when I received my first plants in 1989 (from Geoff Stocker, Malanda, Queensland) I decided to conduct a comparative test of this tolerance.

Identical seedlings were potted up and put into the glasshouse and shadehouse. The glasshouse seedling first flowered in 1992 and has flowered each winter since. The mature pseudobulbs are up to 90cm tall. The plant in the shadehouse has grown steadily but has not yet flowered. The lead growth is only 20cm tall but I expect the next growth to flower as the glasshouse seedling first flowered from a pseudobulb only 30cm high. I have concluded that this species is certainly tolerant of the cold of a Sydney winter but that it will do much better in a heated glasshouse.

I have also had a tray of seedlings out over winter without contracting any of the blemishes characteristic of cold damage. They only started to move after the worst of the summer heat was over. Obviously, *D. crispilinguum* doesn't like the heat of high summer when young.

The adult plants mature their growths without difficulty in the glasshouse. Growth is rapid and the growing pseudobulbs do not appear to be susceptible to rot at the growing point as can others in the Section, such as *D. nindii.* Peak flowering is in late winter, 2–3 inflorescences can arise from each pseudobulb. They are gently arching about 40cm long and producing up to 20 attractive creamy-white flowers with a purple veined labellum.

All my plants are in pots with a basic bark and pebble mix on a 4:1 ratio. Use a size of bark according to the size of the plant. Mature plants do well when the ingredients are roughtly 1.5–2cm in diameter and intermediate plants are happy with a 1cm diameter particle. I've not tried this species on slabs as the pseudobulbs, up to 1m, would be a bit unmanageable in my small structure.

Dendrobium aberrans (Plate 20)

The species from Section *Latouria* exhibit the rich diversity to be found in tropical orchids. From the spectacularly bizarre *D. spectabile* to the tiny dull *D. amphygenyum,* the Section has got it all. Hairy or smooth, full of colour or glistening white, large and showy or small and secretive, there's something for everyone.

One of the more diminutive species is *D. aberrans.* What it lacks in overall size, mature plants are a maximum of 20cm tall, it makes up in the impact of its floral display. An 80mm pot can easily accommodate 25 clavate pseudobulbs (clavate means thin at the bottom and bulbous and round at the top like a club). When it flowers in the late winter or early spring, most of the inflorescences are produced from the new pseudobulbs but some of the older ones will flower as well. The inflorescence is 7cm long, gently arching and bears up to six white, widely opening flowers. Individual flowers are about 2cm wide and last about three weeks.

They sometimes have a flush of pale pink accentuated by a bit of pink on the column. This species has a very curious labellum being mostly broader than long with the side lobes much larger than the mid-lobe. The mid-lobe can be deeply dissected giving a very weird effect to the whole flower. A plant in full flower is a very compact but eye-catching exhibit.

There appears to be few cultural difficulties with this species. An 80mm pot is all that is required. I have had best success using seedling grade bark and pebble mix on the 4:1 ratio again. One problem that occurs from time to time is an emerging pseudobulb will dive down into the potting media rather than growing erect. Such a growth can be salvaged by gently teasing it out and up to the proper orientation. This is best done in the warmth of the day as otherwise, the growth can snap off if it is too cold.

Plants in the shadehouse in winter seem to slow down in growth a bit and don't flower as well as their glasshouse congeners. The pseudobulbs are smaller and you don't get as many flowers on the raceme.

Cribb (1983) gives the altitudinal range for this species as 300–1,900m. Nearly all the plants in cultivation appear to have originated from an early importation from Papua New Guinea by Phil Spence of Bilgola, N.S.W. Certainly the ones distributed by Deane's, Mackinney's, Wondabah and Florafest have been bred from this stock. The parent plants were collected from Agaun on Mt Duau in the southern portion of the Owen Stanley Range. The altitude was approximately 1,800m but the local topography was such that the environment was warmed by exposure to warm air movement from the ocean (P. Spence pers.comm.). Perhaps then, if material of *D. aberrans* could be sourced from a higher, cooler altitude, a better degree of cold tolerance would be exhibited by the progeny? If your shadehouse environment is better than that in western Sydney this species should certainly be given a go. A cool glasshouse would, I imagine, suit this species quite well as it thrives in my heated structure.

Bulbophyllum fritillariiflorum (Plate 19)

The orchids from the Section *Hyalosema* within *Bulbophyllum* have some of the largest individual flowers to be seen in the genus. They are showy plants and certainly attract attention on the showbench. The flowers are produced on solitary inflorescences and are held well clear of the foliage.

In this species the flowers are large, to 7cm long and are held on an inflorescence that can be up to 15cm tall. The dorsal sepal is large as are the lateral sepals. The dorsal is hooded and nestles down onto the lateral sepals which are joined along the lower margin. The flower is basically a dull white but it is heavily marbled or peppered with brownish or purplish red. The petals are tiny, almost vestigial and are barely noticeable next to the column.

In 1989 I obtained my first piece of this species from Ian Walters of Townsville, Queensland. It arrived established on large chunky bits of charcoal in a wire mesh basket. Over time, moss has estalbished over the charcoal. The *B. fritillariiflorum* is still in the basket although pendant growths have been pruned from it many times. Some have been readily established on tree fern totems. It is a vigorous grower so the totem is better cut on the long side rather than square. Try to keep the totem moist at all times although it doesn't seem to mind drying out occasionally if you can't get to the tap for a few days in a row.

It flowers readily under glasshouse conditions, whether hung high in good light or down below under the bench where the light in the structure is poorest. Flowers are produced throughout the year at irregular intervals. A point of interest, summer flowers reach the maximum proportions but flowers produced during the cooler months reach only about 5cm long. Individual flowers last about two weeks.

This species is, unfortunately, often confused with *B. arfakianum* (Plates 21 and 22), mostly because of a transposition of the photographs of the two species in Andreé Millar's "Orchids of Papua New Guinea an Introduction" published in 1978 (Womersley, 1978). Excellent line drawings which illustrate the differences between these taxa have been published by Neville Howcroft (Howcroft, 1992).

I wouldn't recommend this species for shadehouse culture in the temperate areas but it very amenable to warm glasshouse culture.

I hope that these general notes on how I manage my collection and the more specific species accounts stimulates some growers to try some of these more "exotic species". They are not hard to grow — the hardest part can be obtaining the stock in the first place. Nevertheless, the New Guinea and Pacific Island species are becoming more available and cultivation information is filtering through.

I am very grateful that the Australasian Native Orchid Society founding fathers were wise enough to include New Guinea and the Pacific Islands within our boundaries. They certainly tripled or quadrupled the range of species that can be enjoyed within our organisation. Look out for the stock, pester people who you think might know a bit and give the plants a go. It's beyond question that you will be rewarded.

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THE R. D. FITZGERALD TROPHY

For work associated with Australian Native Orchid Species

Ruth Rudkin
18 Lyle Avenue, Lindfield, N.S.W. 2070

This trophy was instituted by the Ira Butler Trophy Committee, to be given to any person who has done significant work in the development, advancement or propagation of Australian native orchid species.

GUIDELINES FOR SUBMISSION FOR THIS TROPHY

1. A submission must originate from one of the following:–
    (a) the Ira Butler Trophy Committee
    (b) Australasian Native Orchid Society Council
    (c) an Australasian Native Orchid Society Group or Associated Native Orchid Society, through Australasian Native Orchid Society Council
    (d) a State Orchid Society
    (e) a State Affiliated Society, through the relevant State Society.

2. The submission must be formally prepared on Society letterhead, signed by the person who prepared it and also signed by the President of the Society.

3. The object of the submission should be to provide enough evidence to convince the members of the Ira Butler Trophy Committee that the nominee is worthy of the trophy. The submission should be prepared on the assumption that the Ira Butler Trophy Committee members know nothing of the work of the nominee, either from first hand knowledge or by reputation and that the members must be persuaded to grant the trophy from that position.

4. A submission should be prepared by someone with a comprehensive knowledge of the work and achievements of the nominee. It should include details of breeding lines, specific breeding plants and results of breeding programmes where appropriate. It should not be a simple overview of the career of the nominee, but a complete and detailed survey from the beginning to the present.

5. Details or copies of writings or papers delivered on the nominee's field of endeavour or expertise should be included. Any experimentation to improve growing techniques undertaken by the nominee or activities designed to encourage the growing of Australian orchids in this country or overseas, should also be detailed.

6. The philosophical aspects of the nominee's approach to his work as it applies to the objects of the trophy should be noted. Information on awarded plants and championship winners will also contribute to the submission.

7. The submission must be supported by a wide range of colour slides and other photographic evidence illustrating the work of the nominee. The Ira Butler Trophy Committee would normally expect a minimum of 40 slides to accompany a submission. A submission guarantees the Ira Butler Trophy Committee the right to reproduce the slides or colour photographs as it sees fit.

8. Some background information on the life and times of the nominee should be included, especially the involvement of the nominee with the local, State and National orchid bodies and judging panels.

LETTERS TO THE EDITOR

"Four Gables" 18 Barclay Rd
Kardinya, W.A. 6163
Phone 61 9 384 4782
Fax 61 9 337 9404

Alexander S. George
Botanist and editor
Valuer, botanical collections

2 July 1995

Dear Walter,

Further to the article by Dr Colin C. Bower, "In Defence of the New Taxonomy", *The Orchadian* 11: 356-357, I would like to point out that the work by Noel Hoffman and Andrew Brown, *Orchids of South-west Australia* (2nd edn., 1994), in fact contains no formally published new taxa or names. There are no Latin descriptions or diagnoses and no type collections are cited. Until that procedure is followed the "new" names are invalid under the *International Code of Botanical Nomenclature* and should not be used in the literature. Because taxonomic concepts and names may change before valid publication, the use of such names may well cause confusion for later workers.

Yours sincerely,
Alex

John Mewburn
Lot 55 Campbell Parade, Beachmere, Qld. 4510
Ph/Fax: (074) 96-8892

Dear Sir,

I feel I must comment on the article by Dr Bower published in the June issue. He states that most modern botanists are **professionals** and that work done previously was mostly by amateurs. Then how come there have been more **stuff-ups** in the past few years than I can remember in the 30 or so years that I have had an interest in native orchids. Not only that, there are, in many cases, **funded blunders.** One thing Dr Bower was right about is that much of the work done previously was by **talented amateurs** whose mostly unfunded work meant they didn't have to look for new species where none exist in order to justify their funding. Undoubtedly new species can easily be found in the terrestrials simply because for much of the year there is nothing to be seen. So you must have time and **money** to sit and wait or get some enthusiastic **talented amateur** to send you samples.

Unfortunately much of the confusion over the past few years is caused simply by the way botanists have to publish their beliefs widely in well known horticultural publications before they are accepted by their peers. Many (perhaps untalented amateurs) accept these findings before they are actually accepted by the R.H.S. changing their name tags on the species and hybrids made with these species straight away. It is not until you try to register a hybrid made with one of these supposed new species that you learn they are not yet accepted. **There must be a better way than this.**

P.S.—The A.O.F. is to be congratulated for helping fund the work being done into viral and fungal infections by Drs Helen Ogle and Don Gowanlock.

David P. Banks
39 Carole Street, Seven Hills, N.S.W 2147

RE: "Large-flowered" *Sarcochilus*

I read with interest Bill Morris' notes on "*Sarcochilus* Breeding" in the last edition of *The Orchadian.* To those who have never tried to hybridise within the Australian *Sarcanthinae,* Mr Morris' recipe for "larger flowers" sounds easy. I wish it was!

Over the decades there have been enormous improvements made in genera such as *Cattleya, Cymbidium, Paphiopedilum* and *Phalaenopsis.* However it must be remembered that all of these genera contain a high percentage of large flowered species. So size has always been "on tap" for those wishing to use it.

The genus *Sarcochilus* and most members of the *Sarcanthinae* are miniature to small growing in size with flowers available in most colours. It is these qualities that have made them popular with orchid growers locally and overseas.

Bill suggests that we use the larger flowered clones of the hybrids *S.* Melba, *S.* Fitzhart, *S.* Melody and the species *S. falcatus* and *S. fitzgeraldii* to get these bigger hybrids. Unless I'm mistaken this will only lead to a proliferation of similar-looking white hybrids with varying amounts of purple in the centre of the flower. Not the "*Sarcochilus* flowers bred to resemble small *Phalaenopsis* with flowers 5–6cm which will grow cool and come in all kinds of colours" which he optimistically envisages. *Sarcochilus* have a charm of their own and I for one would not like to see them all with large round flowers on upright spikes in a range of colours. If that is what really excites one, perhaps a collection of *Odontoglossum* hybrids would fill the void in the orchid collection.

I cannot understand the comment that "small labella" would be rapidly bred out of the hybrids. How? *Sarcochilus* have mostly very small labella in relation to the rest of the floral segments. You will always have small lips. Remember you can't make furniture out of sawdust.

The photos shown in the articles by Frank Simpson and myself are, I believe, a vast improvement on the dainty colourful species in their ancestry such as *S. dilatatus, S. hirticalcar* and *S. spathulatus.* They are certainly larger than the epiphytic parent.

But I suppose the real barrier is getting the plants to co-operate. Many second generation hybrids are very difficult to breed with, unless there is a lot of *S. hartmannii* in them. Many pods unfortunately abort mid-term with nothing in them. This "sterility" factor is the major problem slowing down further advancement within this genus.

Bill is to be commended for at least putting his thoughts on paper for all of us to read. As I am sure this "large" factor is something most of the hybridists have pursued and his comments have certainly generated more discussion on the topic.

I will leave you with an old cliché, "Big is beautiful, but the best things come in small packages".

---

21 Greenvale Grove
Hornsby, N.S.W. 2077

The Editor, *The Orchadian* 12th June, 1995

Dear Editor,

The recent articles on "*Sarcochilus* Breeding" by David Banks and Frank Simpson have been most helpful in increasing our understanding of the species and possibilities in hybridising. Great advancement is being made in *Sarcochilus* breeding, especially in regard to colour and appeal, but as pointed out by Mr Morris in his letter, increases in flower size may not have kept pace with other aspects.

My understanding is that while flower size is a consideration in hybridising, the very nature of our native *Sarcanthinae* makes hybrid breeding rather a lottery. Several constraints are placed upon the breeder when attempting crosses later than primary hybrids, including:–

- Complex hybrids often appear infertile and of no further use in hybridising
- It is necessary to make many crosses in order to obtain a few pods
- Promising crosses often form healthy pods which abort mid-term
- Many pods contain very little viable seed
- Many of the new colours come from diminutive species so size of the resulting hybrid is on the small side
- When small colourful or spotted *Sarcochilus* are crossed with larger types to increase size, the particular features of the smaller flower are often washed out or lost altogether
- Size seems to be influenced by the pod-parent more than the pollen-parent but many crosses usually only "take" by using pollen from the large flower onto the smaller one, thus reducing the likelihood of large flowered progeny
- Although seedling *Sarcochilus* may flower relatively quickly, greater time taken for the pod to form and extra time in flask can cancel out this apparent advantage from a generation to generation aspect

From the above it is obvious that hybridisers of the complex *Sarcochilus* need to be an enthusiastic lot and this is evident in the recent articles by David Banks and Frank Simpson which outline the exciting possibilities that lie ahead.

No doubt size of the *Sarcochilus* hybrids will increase but in the meantime there are equally important goals for the hybridiser including to:–

- Develop more easily grown floriferous pot plants over a wide colour range
- Eventually have *Sarcochilus* flowering prolifically throughout the year. Increasing the number and range at Spring Shows will greatly increase public awareness of these delightful plants
- Improve longevity of flowers and strive to have all flowers open at once
- Improve resistance to spotting of flowers (Botrytis). The introduction of *S. hirticalcar* into hybrids greatly reduces this problem
- In regard to further increasing flower size of the complex hybrids it may first be necessary to selectively line-breed the species *Sarcochilus* and introduce the larger-flowered clones into the hybridising programme as opportunity arises.

Thanks to the patience and persistence of devoted hybridists there has been a rapid increase in both the number and quality of *Sarcochilus* hybrids now freely available to native orchid enthusiasts and the future outlook certainly seems equally exciting.

Sincerely, David Butler

J. T. Woolf, Florafest Orchids
P.O. Box 7011, Toowoomba, Qld. 4352

"The Quest for Size in Australian *Sarcochilus*"

This article is written in response to Mr B. Morris *The Orchadian* Vol. 11 No. 8: 359 regarding the articles by Frank Simpson and David Banks. These articles, I believe, were written with the purpose of sharing their knowledge on the transmission of colour from the different species within the Australian *Sarcochilus* and I also believe size bears little importance when magnificent new colours like those pictured are created. To me, retaining the exquisite shapes of our Australian *Sarcochilus* is far more important. Shapes such as in *Rhinerrhiza divitiflora, Sarcochilus australis, S. fitzgeraldii* and *S. falcatus* must be retained and produced in a rainbow of colour. Hopefully other growers found many points of interest in the articles by Frank and David.

So to answer Mr Morris the following article covers the breeding, so far as those species and hybrids we have flowered, in the quest for size in Australian *Sarcochilus*. The question I would like to ask Mr Morris is "how big?" As we already have, compared to the species and hybrids of say 10 years ago, made huge increases in the size of *Sarcochilus*. Our next objective is to retain this size and produce flowers in a rainbow of colours. Surely we don't want our dainty "*Sarcochilus*" to look like cabbages.

WHAT DO WE HAVE TO USE IN THIS QUEST? THE SPECIES

Sarcochilus falcatus is the most important as we know of it's colour transmission qualities, it also is superbly floriferous, has beautifully rounded segments and already has size with some clones being around 50mm.

Sarcochilus hartmannii the largest of this species and with the best shape are the large 'Blue Knob' clones. Long racemes, excellent well filled in shape, but alas, not much colour transmission and its hybrids normally take a long time to bloom.

Sarcochilus fitzgeraldii with some clones such as '50¢' have already proved themselves, producing extremely large progeny and the colour transmission is good as can be seen in clones like 'Leanne' (Plate 36). But alas, they all look like *S. fitzgeraldii* funny that and also carry the terrific qualities of multiple growth and excellent floriferousness. Other clones now in our breeding programme for size are '75¢', 'Goliath' and the many other large clones from the cross of '50¢' X 'Lorraine' AD/AOC.

THE HYBRIDS — SO FAR

(in order of year of registration)

***Sarcochilus* Fitzhart** *(S. hartmannii X S. fitzgeraldii)* Butler 1963. The largest we have bloomed have come from our 1212 cross, one clone 'The Giant' is by far the largest we have seen with the flowers being 35mm across. For size improvement in hybrids one should seek out the large clones with 'BK' *S. hartmannii* parentage but for better colour tramsmission those with the 'NV' *S. hartmannii* parentage may be best.

***Sarcochilus* Melba** *(S. hartmannii X S. falcatus)* Butler 1966. There are plenty of huge clones coming from recent crossings, however they appear to lack the lovely long racemes of the earlier crosses. The clones coming from 'BK' form of *S. hartmannii* crossed on to the Ravensbourne variety of *S. falcatus* have excellent shape but may not be the best for colour transmission, those made with the Numinbah Valley form of *S. hartmannii* are the ones I would suggest you use.

***Sarcochilus* George Colthup** *(S. hartmannii* X *S.* Melba) Banks 1986. Our 2476 cross produced blooms equally as large as the best 'Melba's', but they have heavier substance and better shape. Colour transmission as yet unknown as further crosses have not yet bloomed.

***Sarcochilus* Melody** *(S.* Melba X *S. fitzgeraldii)* Upton 1987. This grex produced superb results, fast maturing plants, multiple growth habit, floriferousness and size. Shape follows the open style of a good *S. fitzgeraldii,* however we know from the cross using *S. fitzgeraldii* 'Lorraine' AD/AOC that colour transmission is good with the best of these being very colourful (Plate 37). *S.* Melody should now be taken back to large well shaped *S.* George Colthup, *S.* Judith and *S.* Melba.

***Sarcochilus* Judith** *(S.* Melba X *S.* Fitzhart*)* Upton 1992. With the good qualities of both parents, a little smaller than a good *S.* Melba, however the progeny flowered so far are superb — large with good size and shape (Plate 38).

***Sarcochilus* Michael Derham** *(S.* Melba X *S.* Arcadia*)* Derham 1993. These are similar to *S.* Judith with long racemes of well rounded blooms. So far only novelty crosses have bloomed and as in *S.* Judy's Wine colour transmission was not good, however should still be worked with as size and parentage must produce good progeny.

***Sarcochilus* Burgundy On Ice** *(S.* Judith X *S.* Fitzhart*)* Florafest 1994. Results so far within this grex have been excellent, producing large whites of excellent shape and substance with some clones almost half the sepals and petals being solid dark burgundy.

***Sarcochilus* Dorrigo** *(S.* Melba X *S. falcatus)* Fagg 1995. This grex was made with the sole intention of producing large well rounded blooms on very floriferous plants that, hopefully, will allow excellent colour transmission. Those bloomed look like large flat *S. falcatus* with very round segments, shape is a little open like *S. falcatus* however I feel it is the link to large solid coloured *Sarcochilus.*

I have quite a number of crosses in the "pipeline" that will produce large well shaped blooms and a few speculative crosses trying to find out more about the inheritance of colour transmission of our Aussie *Sarcochilus.* Other avenues open to hybridist's include our only member of the *Phalaenopsis* family, *P. amabilis* var. *rosenstromii* and of course the use of the UGHH! exotic species and hybrids in the *Phalaenopsis, Vanda* and *Ascocenda,* etc. . . . yes they do produce lovely hybrids as we have already seen but they aren't pure dinkum Aussies. Breeding for size, colour and cold tolerant one should seriously consider *Vanda coerulea,* we have bloomed *Sarcovanda* Jack Devlin *(Sarcochilus hartmannii* X *Vanda coerulescens)* with long racemes of blue flowers.

So if you're looking for large well shaped Australian *Sarcochilus* they are available, so are plenty of smaller beautifully coloured "Sarco's".

RE: *Sarcochilus* Breeding

WHAT DO PEOPLE WANT?

When I first started hybridising, 14 years ago, all people wanted were large white flowers with good shape, yes hybridisers did that. Then people wanted pink and white flowers with round shapes, well hybridisers did those also. Then people asked why can't we get red flowers, now we have them under way using *S. fitzgeraldii* 'Lorraine' (Plate 39). Now they want very large flowers, we are working on that too.

Why do we have to spoil our *Sarcochilus* in all their daintiest forms. I do not want to make Noritake dinner plates out of them like all the large Melbas being produced today. If Mr Morris knows anything about *Sarcochilus* he would know that the new hybrids are a lot larger than their parents and we are still working on that too.

It is a joy to behold when you have a glasshouse full of these dainty flowers, so why spoil them?

Lorraine Fagg
Highton, Vic. 3216

SHOW REPORT

A.N.O.S. SYDNEY GROUP'S 1994 *SARCANTHINAE* SHOW

Michael Harrison
68 Howes Road,
North Wilberforce, N.S.W. 2756

Australasian Native Orchid Society Sydney Group held its 10th Annual *Sarcanthinae* Show on Sunday, 23rd October, 1994 at Baulkham Hills Community Centre.

As usual, a number of die-hard enthusiasts were on hand to set up from 6.00 a.m. and as the members and visitors arrived one by one, to add their treasures to the assembled display, the show took shape. By 8.30, when judging was to commence, the benches were full of some of the most beautiful and impressive native orchid species and hybrids to be seen.

Champion Native Orchid Species went to *Sarcochilus hartmannii* 'Highlight' HCC/ANOS, benched by Rod and Sue Nelson. A fairly large plant, well established and growing strongly, it carried five arching inflorescences of large, flat, chrystalline white flowers. They were displayed beautifully, with each flower facing outwards and the overall effect was lovely. The Australian Native Orchid Society Judging Panel went on to grant this plant a Highly Commended Certificate (HCC) and thoroughly deserved it was. See Plate 41 *The Orchadian* Vol. 11 No. 7 March, 1995.

There were a number of other very good *S. hartmannii* on the benches as well, with growers such as Ken Russell, Eric and Jim Smith, David Butler and Darryl Smedley featuring prominently.

In the section for *S. fitzgeraldii*, Ken Russell's plant of *S. fitzgeraldii* 'Toska' was a standout and was granted an Award of Distinction (AD) for colour. It featured strong red/purple over the entire face of the flower and really was an impressive sight. See Plate 40 *The Orchadian* Vol. 11 No. 7 March, 1995.

Elsewhere in the sections for species orchids there were some captivating exhibits. I must admit a special affection for the smaller epiphytic sarcanths and there were some fine examples of species such as *S. olivaceus, S. spathulatus, S. hirticalcar, Papillilabium beckleri* and *Plectorrhiza tridentata.* Also represented were a number of tropical favourites including *Phalaenopsis amabilis* var. *rosenstromii* and *Robiquetia wassellii.*

Once again and for the third time in five years, Sid Batchelor's *Sarcochilus* Jewell 'Dungog' HCC/ANOS was Champion Native Hybrid. As its showbench history suggests, this is a difficult orchid to better, for it features all the attributes the judges look for. It carried two pendulous inflorescences of well-displayed, beautifully rounded flowers. Colour is probably the outstanding characteristic of this plant and the flowers have a chrystalline white base with evenly distributed, bright pink blotches and spots. These increase in frequency outwards from the centre of the flower to form solid pink tips to the ends of the floral segments, creating a striking effect. I am sure we will see a lot more of this plant yet.

There were some very good *S.* Fitzhart on the benches, most notably those with strong orange/red colours in the centre of the flower. I expect this hybrid will continue to be a popular and widely grown orchid for years to come. With recent improvements in both *S. hartmannii* and *S. fitzgeraldii*, there is the potential to produce better and better *S.* Fitzharts, particularly because of its vegetative vigour and high flower count. *S.* Heidi (*S.* Fitzhart X *S. hartmannii*) also very much falls into this category of easy to cultivate and very florific *Sarcanthinae* hybrids.

Some terrific colours are now appearing in *Sarcanthinae* hybrids and we saw a number of them at this show. I especially liked *Sarcochilus* Colonial Rose (*S. hartmannii* X *S. serrulatus*) with its chunky brick-red flowers and the spotted grey-blue flowers on several *S.* Susan (*S. falcatus* X *S. weinthalii*) were outstanding. *Plectochilus* Kilgra (*Sarcochilus falcatus* X *Plectorrhiza tridentata*) and *Plectochilus* Richard Jost (*Sarcochilus hartmannii* X *Plectorrhiza tridentata*) are also hybrids that, to my mind, have a lot to offer hybridists in future breeding.

Champion Specimen Plant of the Show went to Rod and Sue Nelson for their beautifully grown and flowered specimen of *Sarcochilus hartmannii.* It really was a fitting champion for our 10th Annual *Sarcanthinae* Show. ✾

SHOW REPORT

1995 DUNGOG SHOW

Michael Harrison
68 Howes Road,
North Wilberforce, N.S.W. 2756

The dull, occasionally drizzly weather certainly didn't keep anyone away from Dungog on Sunday, 21st May. The locals must have thought there was a convention in town and in a way I guess there was.

As happens every year at about this time, native orchid enthusiasts descended upon Dungog for a day of festivities — showing their prized plants and seeing what other growers are producing, catching up with old friends and new, perusing the sales stalls for that special future champion, chatting, gossiping and generally having a great time.

It is amazing just how many people this annual event attracts. At one point around midday, Alwyn Flanagan and I went out the back for a steak sandwich, a sitdown and a bit of a chat and when we returned to the hall, we had to fight our way back inside. The aisles were simply packed with people, shoulder to shoulder and I found it a real struggle to make any headway in the crush (Plate 34).

The Saturday night dinner at Dungog Bowling Club was a marvellous prelude to the events of the following day. It was a chance to socialise with those people who were staying overnight in the town, most of whom had travelled considerable distances to be there for the show. The Chinese food was good and so were the local wines, all arranged of course by our host, Ken Russell.

1995 was undeniably Henk van den Berg's year and he took out Grand Champion and Reserve Champion of the Show. His *Dendrobium bigibbum* 'Top Hat' AM/ANOS, very well grown and flowered, was a most deserving grand champion. It carried three inflorescences, two of them off the leading growth, with 10 or 11 flowers on each. The shapely, purple flowers were about 75mm across, beautifully displayed in even rows and were in peak show condition. Originally, a Ken Russell-bred plant, I asked Henk about the parentage of *D. bigibbum* 'Top Hat'. He said it had come from the cross Ken made between *D. bigibbum* var. *compactum* 'Jellat' and *D. bigibbum* var. *superbum* (compact form) 'Dark' Clone B ex. Mt Molloy.

Following the judging of the show proper, an Australasian Native Orchid Society Award Judging Panel was constituted and *D. bigibbum* 'Top Hat' was assessed for an award. It received an averaged mark of 80.4 and was granted an Australasian Native Orchid Society Award of Merit.

Henk van den Berg's *D.* Peewee was Reserve Champion of the Show. It had fairly tall, slender pseudobulbs (clearly not a "compactum"-style *D.* Peewee) and carried four arching inflorescences. The purple/red flowers, 6 and 7 to the inflorescence were 75mm across and of good symmetrical shape. It was, I believe, about as good a *D.* Peewee as we have seen.

Also performing strongly in the championship stakes, but just pipped at the post, was Phil Spence's *D.* Jungle Gem, a Section *Latouria* hybrid between *D. macrophyllum* and *D.* New Guinea. It featured the lovely erect raceme habit of *D. macrophyllum* and the unusually shaped cream flowers, with purple/brown blotching and spotting, were quite striking. Phil also benched a number of plants of *D. cuthbertsonii,* the lovely miniature species from highland New Guinea, which really created a talking point.

In the section for first flowered seedlings, Henk van den Berg was again a winner with a lovely plant of *D.* Lustrous (*D.* Peewee X *D.* Sunglow). Most of these that we have seen have pink or mauve flowers, but this one had big bold yellow flowers carried on an upright inflorescence. Second in this section was Neville Roper's *D.* Brolga 'Roberta' X *D.* Pinterry, another orchid showing lots of promise.

Norm Mitchell produced a couple of sectional winners, including a very nice *D.* (Sunglow X Carawah), featuring heavy yellow flowers with strong red markings around the centre. This plant only just nudged out Col Brandon's bright yellow *D.* Carawah 'Spot' in the section.

The section for *D.* Hilda Poxon was, as usual, well patronised, with upwards of a dozen plants on display. There were a number of good red-lipped forms, but Neville Roper took out this section with a fine pure lemon yellow form of *D.* Hilda Poxon carrying six inflorescences.

All things considered, the 1995 Dungog Show provided a most enjoyable day for all who attended and participated. Again, congratulations must go to Ken Russell and his crew for creating and maintaining such a successful event on the native orchid calendar.

AUSTRALASIAN ORCHIDS ILLUSTRATED

No. 18: *Dendrobium fleckeri* Rupp *et* C. White

Common Name:	No common name
Subfamily:	Epidendroideae
Tribe:	Epidendreae
Subtribe:	Dendrobiinae
Genus:	*Dendrobium* Swartz

Distribution: *Dendrobium* is a widespread genus, with species found from India and Sri Lanka south to Australia and New Zealand. *Dendrobium fleckeri* is endemic to the south-east of Cape York Peninsula, Queensland and is restricted in its distribution from the Johnstone River north to the Annan River. This species is generally confined to rainforests above 800m.

Notes: The genus *Dendrobium* is one of the largest genera in the *Orchidaceae* and is estimated to contain between 900 and 1,400 species. *Dendrobium fleckeri* generally grows as a lithophyte at lower altitudes and as an epiphyte higher up the mountains in the cloud forests. This species was named in honour of Dr Hugo flecker, a medical practitioner and natural historian. After Flecker arrived in Cairns he was instrumental in forming the North Queensland Naturalist's Club and in starting the publication *The North Queensland Naturalist.* Following a suggestion by Cyril White, the Queensland botanist, Flecker started a local herbarium which when donated to C.S.I.R.O. in 1971 contained over 10,000 specimens including a number of type specimens. In recognition of Flecker's contribution, at least six plant and two animal taxa have been named in his honour. The pseudobulbs of *D. fleckeri* are generally slender and elongated, although there are two vegetative forms, with the pseudobulbs of one being shorter and more robust than the other. The more elongated form is generally found at higher altitudes in the cloud forest. The pseudobulbs are generally a uniform thickness thoughout their length and produce 1–4 apical leaves. Whilst this orchid is not a profuse flowerer, short racemes are produced in spring and summer and each contain up to three apricot-yellow flowers. The shape of the flower is dominated by the ovate dorsal sepal and triangular lateral sepals, while the labellum is distinctive as the margins of the midlobe have a dense covering of cilia. The flowers produce a sweet, musky aroma.

Pollination: There is no recorded pollinator for this species, although it is likely that the combination of the aroma and the ciliate labellum will be attracting the pollinators.

Conservation Status: This species is not considered to be currently under threat. Although it is restricted to a limited habitat in a narrow geographic range, it is locally common.

Culture: *Dendrobium fleckeri* can be cultivated in pots or on mounts. The plants prefer to be grown in cool, humid conditions. They will withstand 0°C for a short period, although they prefer a slightly higher temperature. If grown on a mount, they should not be allowed to dry out over summer. These plants are generally suitable to be grown in a bushhouse or an unheated glasshouse and are often grown under benches alongside ferns.

Illustration: Painting: Illustrated is a large clump of *D. fleckeri* with a few pseudobulbs producing racemes with 1–2 flowers.

Description: Tony Slater, 17 Dudley Street, Mitcham, Victoria 3132.

Illustration: Louise Saunders, 8 Lisa Street, Cleveland, Queensland 4163.

Line Drawings and Captions: Walter T. Upton, P.O. Box 215, West Gosford, NSW 2250.

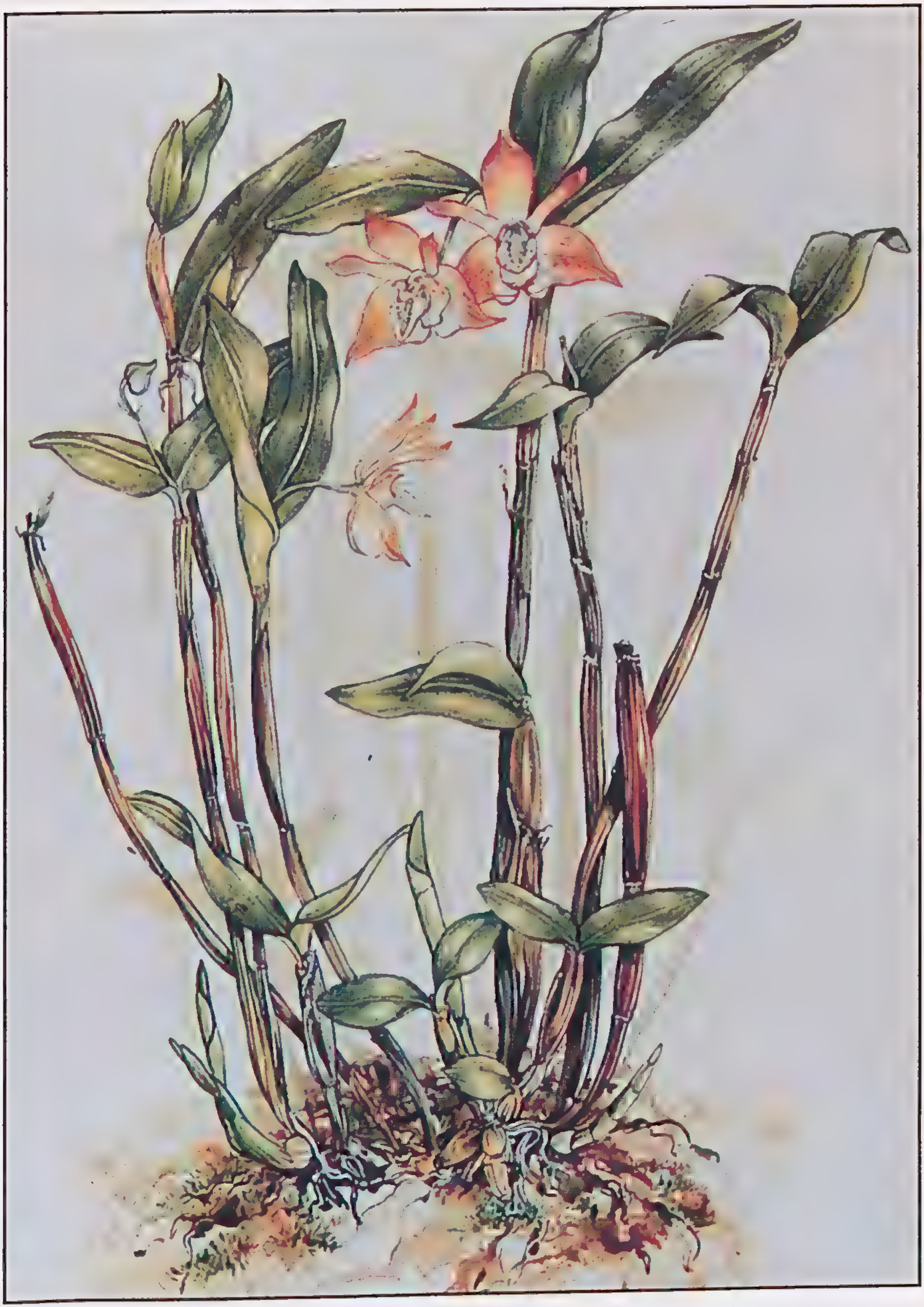
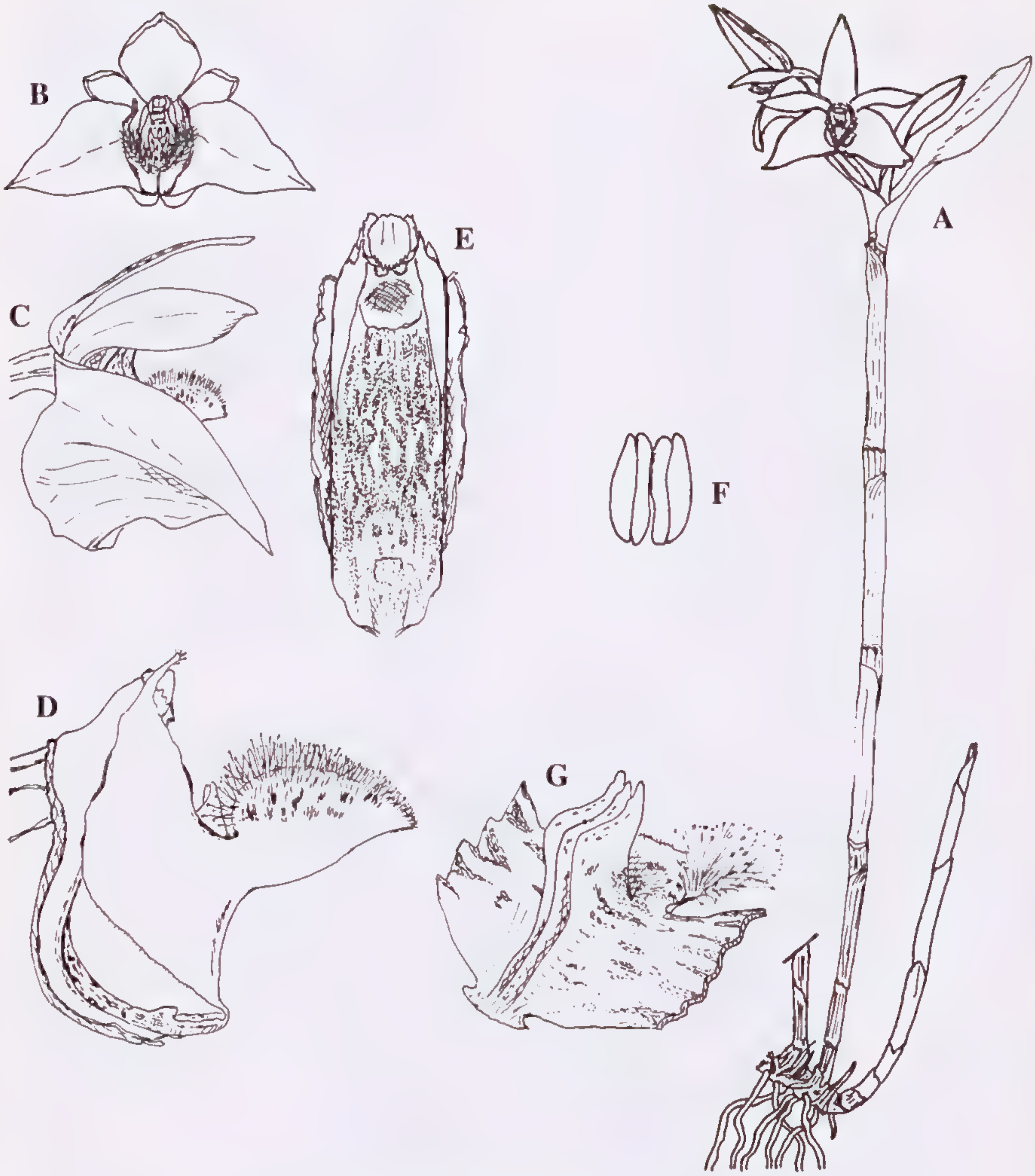


Plate 33: *Dendrobium fleckeri* Rupp *et* C. White
From a painting by Louise Saunders.



Dendrobium fleckeri Rupp *et* C. White

Collected by S. Clemesha, Mt Lewis, North Queensland.

A. Plant	⅔X
B. Flower, front view	1⅓X
C. Flower, side view	2X
D. Column and labellum, side view	4X
E. Column, front view	4X
F. Pollinia	approx. 20X
G. Callus on labellum	approx. 6X

BOOK REVIEW

DENDROBIUM KINGIANUM: A UNIQUE AUSTRALIAN ORCHID
By Peter B. Adams, Ph.D. and Sheryl D. Lawson.
305mm x 215mm, 4 colour cover and dust jacket. 195 pages, with 216 four colour illustration, plus 13 black and white figures.
ISBN 1 875902 01 5.
Recommended Retail Price $85.00.
Sponsored by the Queensland Office of Arts and Cultural Development.
Published in 1995 by Central Queensland University Press, P.O. Box 1615, Rockhampton, Queensland 4702.

A book unique in Australia, totally devoted to the study of one orchid species *Dendrobium kingianum.* An orchid renowned for the beauty and diversity of its floral forms and varied physical characteristics throughout its range, from the Carnarvon Gorge to the Hunter River. I do hope that this work does not remain "unique" for very long and that Peter and Sheryl may be induced to produce similar works on other horticulturally desirable Australian native orchid species.

This book forms the backbone of our knowledge of the species in all its mutitudinous forms and was a pleasure to read. The authors have obviously spent much time on its development and it will be of great benefit to all native orchid enthusiasts.

As the authors point out, much of the early collecting history of this orchid is clouded in heresay and doubtful records. We cannot let similar information on other desirable orchid species be lost.

The book covers the history, distribution, biology, conservation, taxonomy, colour categories, culture, breeding, hybrids with *D. kingianum* parentage, specialist collections, exhibiting, labelling, a register of over 300 individual plants plus appendices.

In the chapter: "HISTORY OF COLLECTING AND GROWING DENDROBIUM KINGIANUM", I am saddened to note the names excluded, exceed those included. What of Upton, Borger, Leaver, Leaney, Rupp, Dockrill, Cady, Deane, Blombery, Scammell, Loader, Fordham, Clemesha, Harrison, Smedley, Batchelor, Walsh, Everingham, Friar, Dowling, Hazelwood, Banks, Robert, Bradford, Corrigan and others?

Reference is made on page 1 to 'Corrigan's Red' (5X as I referred to it), being a stunning exhibit at the 6th World Orchid Conference in 1969. The plant undoubtedly received its greatest accolade in 1968, to the chagrin of exotic orchid growers, when it received "Most Pre-Eminent Entry" in show, certificate and medal, from the Australian Orchid Council at the annual spring show of the Orchid Society of N.S.W., at the Sydney Town Hall.

It created such interest that I have never revealed where I collected it, to deliberately avoid the exploratory rush and illegal collection referred to. Peter deduces by its colour and habit where it might have been collected. The plant was not in flower when collected in 1961 and I was alone, on private property, photographing *Sarcochilus hartmannii.* The colour reproduction on page 77 is the real thing. However, if grown in Sydney, in full sun the colour will intensify. I have judged plants purporting to be this form, including plants with the Merellen Orchids label, which were not 'Corrigan's Red'. The plant had only very limited distribution in specialist collections, although one plant was given to an early hybridist on condition that it never be sold, which he subsequently did! I can only assume that plants have been mistakenly sold to hybridists like Ted and Barbara as the real thing, either in ignorance or error.

Eric Gordon is rightly mentioned (page 3). He was a dedicated collector for the Royal Botanic Garden and National Herbarium where he worked in an honorary capacity every week for many years. Eric had very limited climbing ability due to thrombosis in both legs and his visits to the Bucketts were organised by Kel Ellis, courtesy of the Brown brothers, their tractor and trailer.

Reference to Eric acquiring *Dendrobium kingianum* 'Cyclamen' is interesting, he may have had the plant as *D. kingianum* but nothing else. Eric, whom I knew and worked with for the past 30 years of his life never used "horticultural" names, which he treated with total contempt. When he saw *D. kingianum* 'Corrigan's Red' on the morning the buds first opened, he made very caustic comments on the XXXXX that I had hastily added to the label to denote something out of the ordinary!

I have to take issue on the use of the term "cane" and "spike" throughout the book in the name of brevity. Brevity cannot excuse a term being used that does not correctly described the plant segment you are describing. The term spike was a name long used by unknowing *Cymbidium* growers and to quote Arditti: "Spikes resemble racemes (this is probably the reason why orchid inflorescences are usually and erroneously called spikes), but bear sessile (without a stalk) flowers. They are not common in the *Orchidaceae*". Whilst some orchids have stems and pseudobulbs that resemble "canes", dendrobiums are described by Rupp as: "Stems erect, creeping, or pendulous; stout and rigid or slender and lax; often reduced to short pseudobulbs, or pseudobulbous about the base". Terms that the authors intermingle with "canes" throughout the book. I am sure that readers would have been far more comfortable with pseudobulbs throughout. On page 47 Ira Butler's hybrids are mentioned and I quote: ". . . but the details of parentage appear to have been lost". These records have not been lost and are in safe keeping.

Dendrobium kingianum 'Cedar Falls' (page 173) was collected and named by me in 1961, in the company of Joe Lightbody, on a volcanic remnant near Cedar Falls, whilst gem prospecting. The pseudobulbs were 27" (685mm) tall in situ. Ira Butler used the plant as a parent in many of his hybrids, notably *D.* Bardo Rose. In Sydney the plant seldom exceeds some 450mm.

D. kingianum 'Albert West' (page 123) is a much grown plant whose origin I may be able to throw some light on. Wally Upton and I both recall Albert West telling us separately, that he had received the plant from an aunt who had purchased it from a stall.

My copy of this colourful and fascinating book is from the publishers and I thoroughly recommend that you invest in a copy at once. As I mentioned at the beginning of this review, I hope this is the first in a series devoted to varied forms of our more desirable Australian native orchids.

Murray J. G. Corrigan ✾

Plate 34: General view of Ken Russell's Show. Photo: D. Banks.

Plate 35: Wide Bay weekend — guest speakers (from left to right): Colin Bower, Neville Howcroft, Peter Adams, Alick Dockrill, John Hazelwood, Len Lawler and Wal Upton. Photo: J. Upton.

AROUND THE GROUPS

A.N.O.S. NORTHERN REGIONAL COUNCIL

Meeting No. 5, held 28th May, 1995 at Maryborough, hosted by the Wide Bay Group.

Membership fees due 1st July, 1995.

Foundation membership is being offered to anyone who is a member of one of the Groups. Cost: $10.00.

Groups are asked if they can supply, gratis, to the Council, slide programmes for a library. These programmes will be available to other groups for feature items at their meetings.

Registrar's Report: John Hazelwood reported that the panel had awarded its first plant. It was granted an Award of Cultural Commendation with 80.7 points. It was *Dendrobium bigibbum* var. *superbum*. The plant had a diameter of 1.45m 75 inflorescences, 750 open flowers and 250 buds. It was grown on Bribie Island in an open basket hung up under shadecloth.

It will be early 1996 before the panel can undertake judging classes. Groups are aked to ascertain if there are any members in their groups who will be willing to undertake the training.

Following a proposal from Len Lawler and Mary Friederichs (daughter of the late Ken MacPherson), the Council has decided to establish a sub-committee to plan the proposed Kenneth Alexander MacPherson Memorial Lectures. In recognition of the work Ken has done in the breeding of native orchids. It is proposed that these lectures should be treated with due respect and as a prestigious event.

It has been proposed that the lectures should be presented by a prominent Australasian orchid personage, wherever possible on Australian orchids, at a major gathering of Australian orchid growers.

Those invited on to the sub-committee are Lynn Verroen, chairperson; Len Lawler and Harry Verroen with Mary Friederichs as an ex-officio member.

A.N.O.S. CENTRAL COAST

Change of meeting venue and day — Gosford City Art Centre, 36 Webb Street, East Gosford. Third Friday each month, 7.30 p.m.

A.N.O.S. MID NORTH COAST GROUP

At the A.G.M. the following officers were elected:–

President:	D. Sinclair
Vice-Presidents:	S. Burton and J. Zietsch
Secretary:	J. Donnelly
Treasurer:	D. Rideout

Secretary can be contacted on (065) 52-4954 (H) or (065) 51-0464 (W). Mail to J. Donnelly, 14 Valerie Street, Taree, N.S.W. 2430. Meetings held last Friday of each month either Taree or Wauchope.

A.N.O.S. VICTORIAN GROUP INC.

Because the Herbarium is no longer available for our meetings, we have changed our venue. We also have a new Secretary, Jeanne Dunn. Our post office box number remains the same, but the telephone number is now (03) 9584-7692.

Meetings 8.00 p.m., first Friday each month, Demonstration Hall, Burnley Horticultural College, Swan Street/Yarra Boulevard, Burnley. (Melway Map 45, A–12).

A.N.O.S. NEW ZEALAND

Please forward correspondence to the president, Lex Sharp at 40 Victoria Street, Warkworth, New Zealand, as the secretary has resigned.

Lavarack & Gray – *Tropical Orchids of Australia*	$12.50
Hoffman & Brown – *Orchids of South-west Australia*	$57.50
Dockrill – *Australian Indigenous Orchids*	$75.00
Seidenfaden & Wood – *Orchids of Peninsula Malaysia & Singapore*	$115.00
Vermeulen – *Orchids of Borneo* Vol. 2	$60.00
Comber – *Orchids of Java*	$70.00
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R.B.G. Kew – *Revision Dendrobium* sect. *Oxyglossum*	$42.50
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N.O.S.S.A.

Programme table for the Third Australasian Native Orchid Conference 26-30th September, 1996.

Ted Gregory	*Sarcochilus fitzgeraldii*
John Wolff	Recent trends in novelty *Sarcochilus*
Les Nesbitt	Conservation of orchids on a bush block
Bruce Mules	Growing natives in arid areas
Helen Richards	You can have a darn good collection of species Terrestrials
David Banks	One hour wonders and rarely seen Australasian orchid species
Phil Spence	Australasian species – Hybridising with New Guinea Dendrobiums
Wal Upton	Hybridising with the genus *Dendrobium* in Australia
Daryl Smedley	Miniature orchids of Australia
Tad Bartareau	Specificty and mutual dependency in pollination of Australian epiphytic orchids by native bees
Wayne Harris	The evolution and distribution of the Australasian orchids
Lorraine Fagg	*Sarcochilus* species in the wild and the latest hybridisation
Tony Slater	Can we develop cut flowers from Australian natives
Neville Howcroft	
Ron Heberle	Caladenias and their putative hybrids of Western Australia
Andrew Brown	Aspects of the biology and ecology of Western Australia native orchids
Geoff Stocker	Selected orchids of Papua New Guinea – notes on habitat and cultivation
Malcolm Campbell	Hybridising between Australian and New Zealand genera

DAYBORO SHOW

Sunday, 2nd October, 1994 saw the first Charity Festival of Australian Native Orchids at Dayboro and it was very successful to the tune of $500 raised for Queensland Renal Unit based at Keperra Hospital in Brisbance.

The most gratifying thing of all was that it was the first time in Queensland that a show was made up entirely of Australian natives and proved so successful that it is on again on Sunday, 1st October, same venue Dayboro Community Hall and promises to be equal or better than 1994. It is a show open to all growers with benching on the day at 7.00 a.m. and judging by A.N.O.S. at 9.00 a.m. and open to the public at 10.00 a.m.

There is an all day barbecue. Restaurant, café and hotel meals all close by. There is also limited accommodation at the Dayboro Hotel so early bookings are essential. There will be a dinner following completion of the show for visitors and anyone who wishes to attend, venue details yet to be decided.

For further details contact show sponsor Frank or Bev, at Simpson Orchids, 29 Gannon Street, Mt Mee, Queensland 4521 — phone: (074) 98-2185 or mobile 015 63-6289.

MARYBOROUGH WEEKEND

Greig K. Bolderrow

On the weekend of 27th and 28th May, the Australasian Native Orchid Society Wide Bay Group Inc. held another successful orchid weekend in Maryborough. The weekend was an opportunity for Australasian native orchid enthusiasts to get together and socialise and discuss their hobby with people that share the same interests. Registrants came from as far away as Gosford and Mackay to listen to an impressive line-up of guest speakers (Plate 35).

The weekend started on the Saturday morning with a tribute to the late Ken MacPherson delivered by orchid identity and friend Len Lawler. Len then followed on with an interesting talk on "The Origins of Our Native Orchids". Alick Dockrill spoke on the people responsible for the early discovery of our orchids. Special guest speaker for the weekend was Neville Howcroft from Papua New Guinea, who had everyone enthralled with his presentation and later gave a slide presentation that convinced a lot of guests to add Papua New Guinea natives to their collection.

Wal Upton officially launched the new

orchid book by Peter Adams and Sheryl Lawson "*Dendrobium kingianum:* A Unique Australian Orchid". The launch was followed by an entertaining lecture on *D. kingianum* by Peter, entitled "*D. kingianum* Bidw. — Crazy Collecting, Culturing and Conserving". The lecture was accompanied by an impressive slide presentation. Wal Upton was never going to get away with something as simple and non taxing as a book launch and true to form his lecture "*Sarcochilus* Orchids" was informative and very well received by all present.

What would a weekend on orchids be without a topic to stir the grey matter and Dr Colin Bower's lecture "Experimental Determination of Specific Pollinators in the Sexually Deceptive Genus *Chiloglottis* and Their Use in Taxonomy", did just that. This lecture was the theme for quite an amount of discussion at the spit roast on Saturday night.

The Sunday lecture programme included a talk by Northern Regional Council President and Queensland Registrar of Judges, John Hazelwood, on just what the judges are looking for. This was followed by a talk on the Australian Orchid Foundation delivered by Len Lawler. The other highlight of the Sunday programme was a display of paintings by renowned botanical artist Louise Saunders. the weekend concluded with a plant auction, plant sales tables and a lunch time barbecue.

All who attended voted the weekend a huge success. The organisers would like to take this opportunity to thank the two major sponsors Air Niugini and Kingfisher Bay Resort and Village for their contributions to the success of the weekend and also the many minor sponsors who provided articles for auction.

A 70 page lecture notes booklet from the weekend is available for purchase from the Secretary, P.O. Box 15, Tinana, Queensland 4650. Cost of these notes is $12.00 postage included. ✾

SHOW DATES

QUEENSLAND		
Kabi	14th-16th Sept.	Chermside Shopping Centre
N.O.S. of Toowoomba	21st-22nd Oct.	Harristown State High School, South St., Toowoomba
NEW SOUTH WALES		
Central Coast	2nd-3rd Sept.	East Gosford Progress Hall, Cnr. Henry Parry Dr. & Wells St., East Gosford
Macarthur & District	21st-23rd Sept.	Casula Mall, Kurrajong Rd., Casula
	14th-15 Oct.	*Sarcochilus* Show, Tim's Garden Centre, Narellan Rd., Mount Annan
Mid North Coast	13th-14th Oct.	Manning Mall, Taree
Newcastle	17th Sept.	Hunter Region Botanic Gardens
	14th-15th Oct.	*Sarcochilus* Show, Hunter Region Botanic Gardens
Port Hacking	10th Sept.	Spring Show
	29th Oct.	*Sarcochilus* Show, both at Scout Hall, Oliver St., Heathcote
Sydney	9th-10th Sept.	Baulkham Hills Community Centre
	22nd Oct.	*Sarcochilus* Show, Baulkham Hills Community Centre
Warringah	9th-10th Sept.	Forestville Memorial Hall Starkey St., Forestville
Wollongong and District	15th-17th Sept.	Wollongong Botanic Garden
	20th-22nd Oct.	*Sarcochilus* Show, Westfield Shopping Centre, Figtree
SOUTH AUSTRALIA		
N.O.S.S.A.	23rd-24th Sept.	St Peters Town, Adelaide
VICTORIA		
Geelong	4th-5th Nov.	The Masonic Hall, Gheringhap St., Geelong
Victoria	30th Sept.-1st Oct.	Holmesglen College of T.A.F.E., Waverley Campus, 585 Waverley Rd., Glen Waverley
WESTERN AUSTRALIA		
A.N.O.S. of W.A.	7th-9th Sept.	The Grove Shopping Centre, Cottesloe

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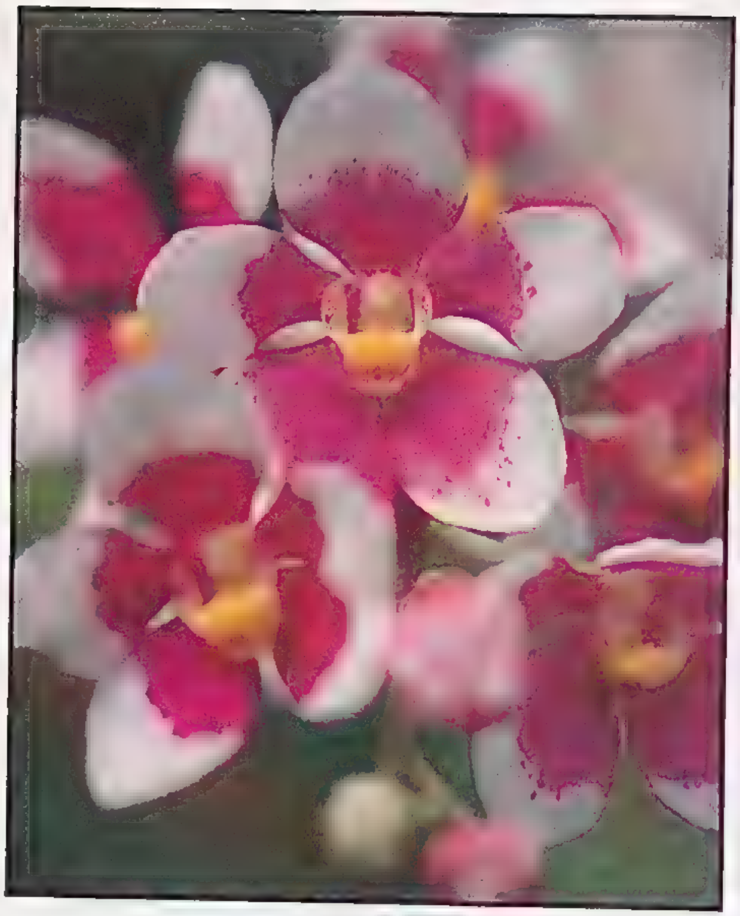

Plate 36: *Sarcochilus fitzgeraldii* 'Leanne'.
Grower: L. Fagg. Photo: J. Woolf.

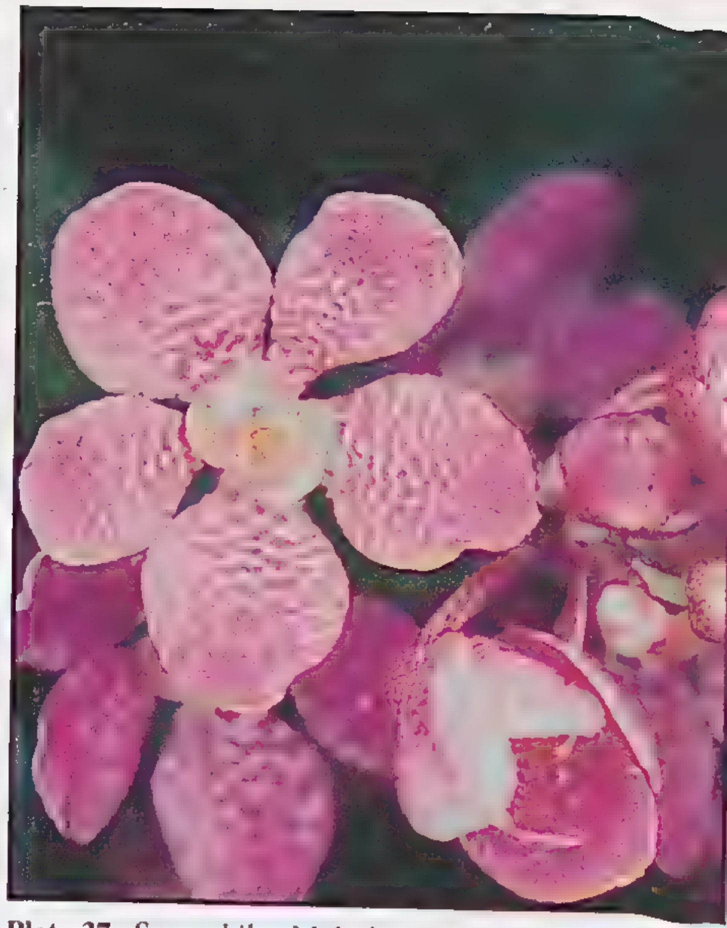

Plate 37: *Sarcochilus* Melody. Photo: J. Woolf.

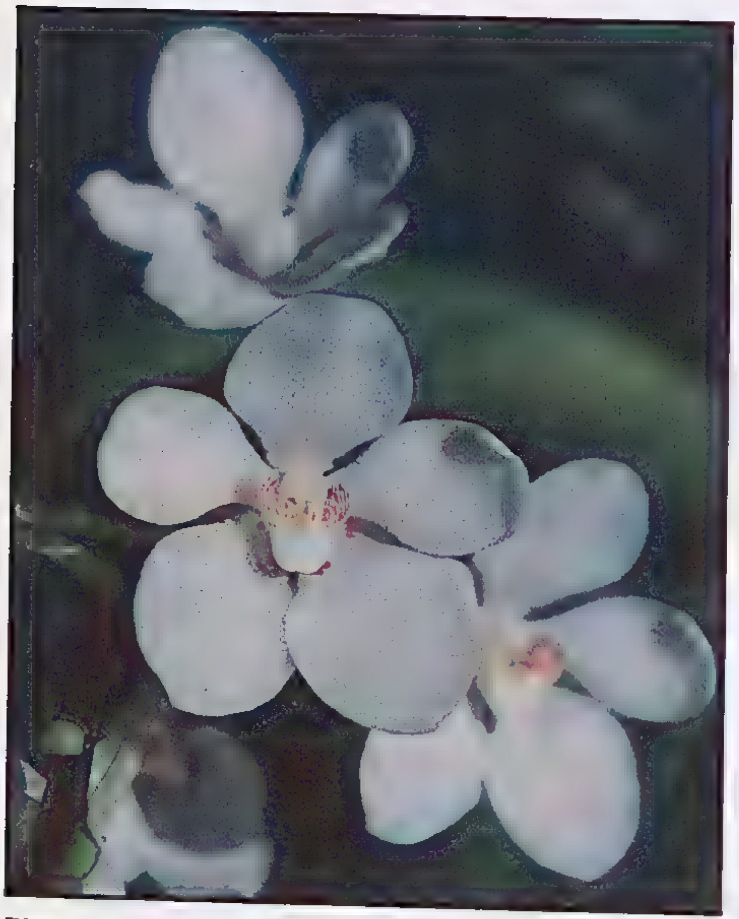

Plate 38: *Sarcochilus* Judith HCC/QOS.
Grower: R. Kanowski. Photo: J. Woolf.

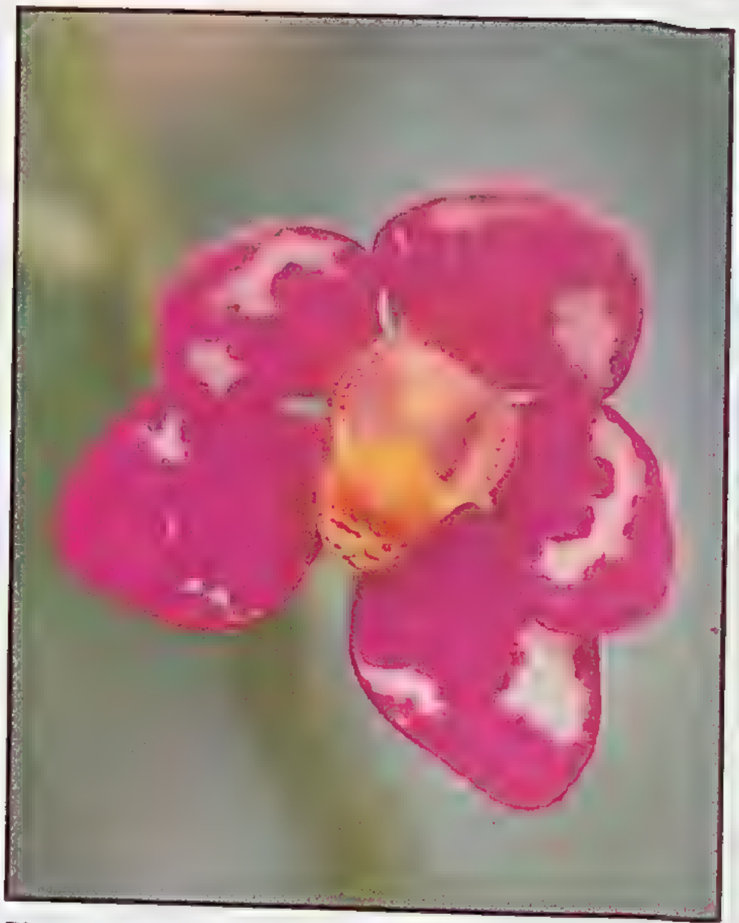

Plate 39: *Sarcochilus fitzgeraldii* 'Red Light'
('Lorraine' X 'Good Pink'). Photo: L. Fagg.

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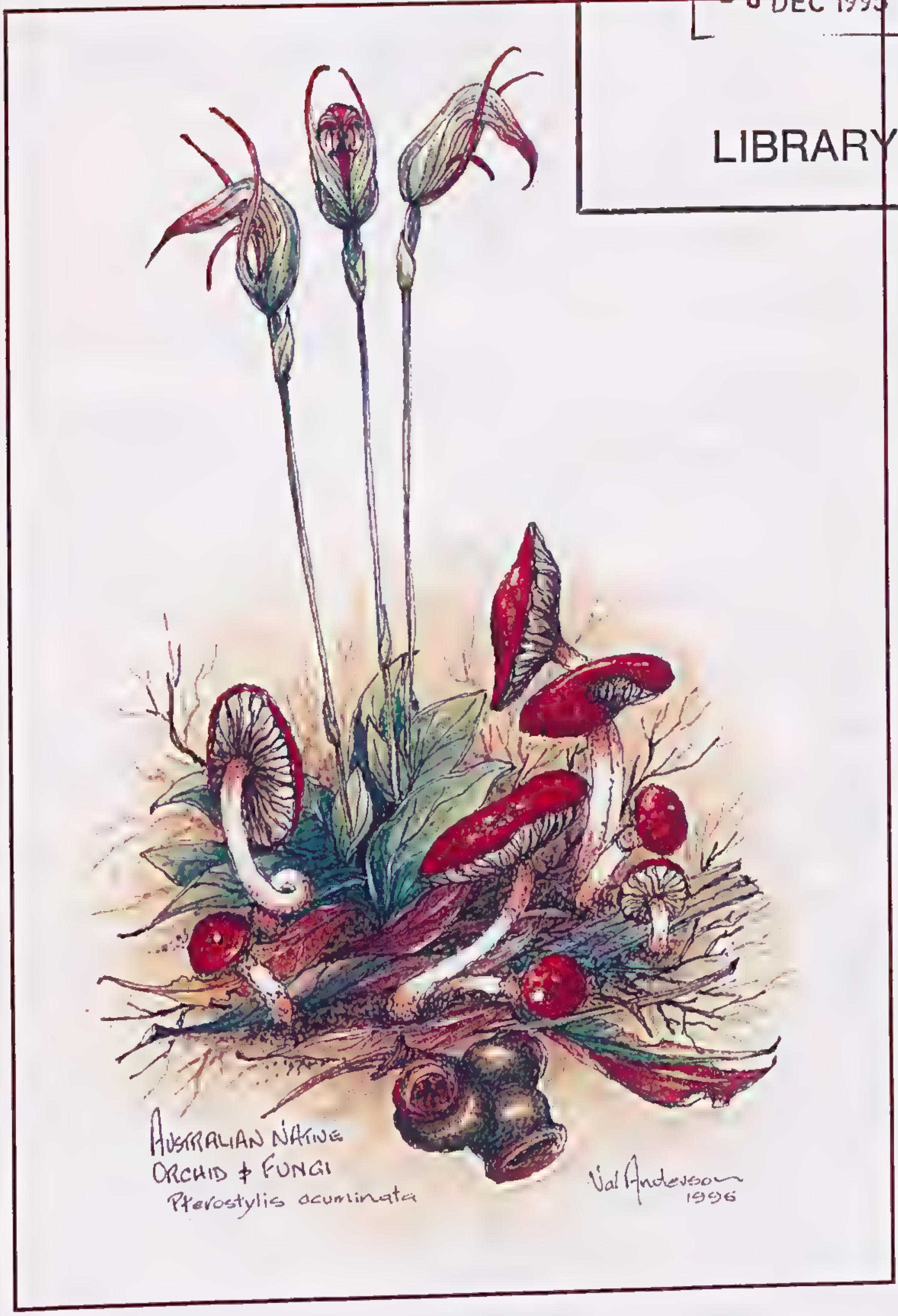

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ARTICLES:
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TALKING POINT

The problem created by the renaming of many of our most popular native orchids has caused a lot of uncertainty and confusion. Name changes in most plant families are accepted until someone produces a good case against them. The new names are not going to go away and they will be included in the Flora of Australia at present being prepared. The champions of our native orchids who disagree with the name changes will need to put forward a very strong argument to change the present course. The case for the "new" names is a strong one and much is based on scientific research. Let us overcome our prejudices and accept all the names so that we can show a united front to the world. The future will prove whether this action is indisputable or not.

Walter T. Upton

Seasons Greetings

and

Best Wishes

for the New Year

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THE ORCHADIAN

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HERMAN MONTAGUE RUCKER RUPP, THE ORCHID MAN OF PATERSON

Val Anderson
Honorary Curator
Paterson Court House Museum
Paterson, N.S.W. 2421

"It is the unique character of the orchid flower that has always held me spellbound."
H. M. R. Rupp – July, 1946

It is now three years since Bill and Mabs Keppie, life members of Paterson Historical Society commenced retracing the native orchid listings of Revd. H. M. R. Rupp, incumbant of St. Paul's Anglican Church, Paterson 1926–1930.

It is hard to estimate the number of kilometres walked and driven by Mabs and Bill in their quest to trace the steps of this much-loved gentle man. The Keppies "place", *Glenlossie* was visited many times by Revd. Rupp during his wanderings around the hills of Paterson, a small rural town in the lower Hunter Valley.

Mabs often brings specimens to our society meetings particularly when a plant has been found that is not on Rupp's listing. Bill and Mabs affinity with the land and their knowledge of Paterson is quite remarkable — Bill was introduced to native orchids by his father and he in turn by his father.

Bill and Mabs four children and their families have settled on *Glenlossie* and as each grandchild is able to appreciate the beautiful surroundings they are introduced to nature and the charm and uniqueness of our native orchids.

The main feature at the Tocal Field Days was the Rupp project while at the Paterson Valley Landcare booth, Mabs folio created much interest.

Dr Bill Hunter of Seaham, a nearby village, has become aware of the Paterson enthusiasm and is also recording native orchids on his property. Last season Bill identified *Caladenia carnea, C. catenata, Calochilus robertsonii, Diuris chrysantha, Dipodium punctatum, Microtis parviflora, Thelymitra pauciflora* and *Spiranthes sinensis.*

Tremendous help is being given with identification by Sue Herd, former secretary of Newcastle A.N.O.S. and at present Director — Established Gardens and Facilities at the Hunter Region Botanic Gardens, Raymond Terrace.

The project would not have been complete without the encouragement of our President, Cameron Archer and the co-operation of his staff at Tocal Agricultural College, Paterson.

Thank you, Lionel Gilbert for your excellent book, "The Orchid Man."

Rest well Revd. Rupp, your love of our Australian native orchids is not forgotten in Paterson!

Orchids relocated for the first time in 1994 — Lyn Walsh, Tocal Agricultural College, Paterson:–

> *Sarcochilus olivaceus, Thelymitra ixioides, Genoplesium rufum, G. acuminatum, G. pumilum, G. mollissimum, Corybas pruinosus, C. barbarae, Pterostylis ophioglossa, P. collina, P. concinna, P. pedunculata, P. obtusa, P. longifolia, P. reflexa, Cyrtostylis reniformis, Acianthus exsertus, Eriochilus autumnalis, Chiloglottis trapeziformis, C. reflexa, C. platyptera.*

This is the final article of the Revd. Rupp project conducted by members of the Paterson Historical Society. The two previous articles appeared in Volume 10, Number 12 and Volume 11, Number 3.

*

VALE — "BELLANGRY HARTMANII"

Gerry Walsh
7 Leslie Court,
Werrington, N.S.W. 2747

Up Port Macquarie way, in the high mountains west and north of Wauchope, where the mighty Hastings and Wilson Rivers are born in pristine isolation, there flourishes an unrivalled eco-system of rainforests, lofty hardwood forests and a magical orchid flora that is the equal of any other in temperate Australia. From craggy cliffs reaching over 1,200m above sea level, through the ancient moss-shrouded Antartic Beech forests and descending steeply to the valley floors where palm forests dominate sub-tropical jungles, native orchids remain highly conspicuous.

One of the less common but much revered species to be found there is *Sarcochilus aequalis* formerly known widely as the southern form of *S. hartmannii.* There is a colony of this rather elusive orchid that has long been known as the "Bellangry Form" of *S. hartmannii.* Old Orchadians have articles by many authors who refer to this "Bellangry Form". I first visited the home of "Bellangry Hartmanii" in October, 1987. I would judge the site as covering roughtly two hectares. It is a very steep slope clothed in *Eucalyptus* forest, interspersed with Myrtle and small *Ficus* species and studded with massive rock outcrops, some as large as houses. The orchids observed growing there are: *Bulbophyllum elisae* (red/brown form), *Cymbidium suave, Dendrobium aemulum, D. falcorostrum* (one clump on rock), *D. gracilicaule, D. kingianum, D. linguiforme, D. pugioniforme, D. speciosum* var. *hillii, (D. tarberi), D. teretifolium* var. *fairfaxii (D. fairfaxii), Liparis reflexa, Sarcochilus falcatus* (many on rock), *S. spathulatus* and of course, *S. aequalis.*

I could never forget the sight of those huge clumps of *S. aequalis* nestling proudly amongst the carpet of *Dendrobium kingianum* and *Liparis reflexa.* These plants did not spread out so much as grow tall — something like small vandas. Vegetatively they were extraordinarily robust for any form of *Sarcochilus hartmannii* and it was also quite abundant. I will always regret having left my camera in the car and not having sufficient time to go fetch it. Ever since that first visit, I have longed for the opportunity to return. It took eight years, but on Tuesday, 5th September, 1995, I did return — this time my camera hung around my neck.

I spent four hours spidering all about those rocky outcrops. The huge carpets of *Dendrobium kingianum* and *Liparis reflexa* looked totally content and healthy, just as I remembered. Most of the other species were still there as well. But the famous southern form of *Sarcochilus hartmannii,* that much discussed and much written about orchid, it was gone. It is extinct in the wild.

It was not dead on the rocks, no drought had destroyed it. No fire has swept up the hillside and selected the *S. aequalis* for martyrdom over all the other species that have not as yet disappeared. Could some ravernous insect or animal have devoured all those hundreds of plants? Extremely unlikely I would say. What then?

One aspect has changed in the locale. The steep sniggering track used by loggers in the past to move the felled trees to the road, had been merely a one lane wallaby track on my first visit. Some time during the next eight years, somebody went to great effort to get a vehicle down that steep 200m long pinch. The twin wheel ruts are old but easily seen. I hardly need to tell you why . . . but I will. I can come up with no other explanation for the extinction of this one great colony other than professional pickers making a raid and plundering the whole population. It would have been necessary to use extension poles with hooks attached to reach those plants where a man could not climb. I think we have all heard stories about certain collectors who were known to use such implements.

I will come clean, I have to report that there is still three small plants hanging in there, two of these would fit in seedling pots, the other being about half the size of this Orchadian page. This "big" one has a raceme with three buds on board. May it attract a pollinator — may it become pregnant — may it return this ghost colony to its former glory. Perhaps a hundred year job? The chances of success must be astronomical.

If you have pieces in your collection with known Bellangry origins, please pass bits of it around to other growers. A captive gene pool is no replacement for a wild one where natural selection and evolution can continue without human interference. To have a captive gene pool is only one step above extinction — but it is better than extinction. If you are not absolutely convinced of the origins of your plants of *S. aequalis* it would be far better to not attach an errant location to your tags at all. If you get it wrong, you will only stuff up the future efforts of anybody who may strive to keep the Bellangry form pure. Please do not do that!

To all you old timers who once enjoyed a visit to that rocky hillside to ogle at those fantastic clumps of *S. aequalis,* to all the long term members of A.N.O.S. Warringah Group, who spent occasional weekends camping at the nearby Forestry hut, I am sorry to have to deliver the bad news to you. Did any of you ever carry a camera in with you?

To the mongrels who perpetrated this stupid destruction — I hope the pocket money you illicitly procured caused you a massive hangover. And I also hope you may long rot in hell.

VALE — ROBERT MALCOM LOWE, 1918–1995

Walter T. Upton

We were all saddened to hear of the passing of Bob Lowe on Wednesday, 20th September, 1995. He was one of our Foundation members and a Past President.

Bob was Vice-President in 1971 and again from 1974 to 1978, between these times he was the fifth President of A.N.O.S. from 1972 to 1974.

His practical knowledge of our native orchids was of great assistance to us when he served on the Judging Standards Sub-Committee under my chairmanship, bringing the A.N.O.S. Native Orchid Judging Standards into fruition in 1978. He assisted in the initial A.N.O.S. Judging Course and was one of the first four A.N.O.S. Judges to be appointed by A.N.O.S. Council in 1978.

He was very active in Warringah Group from the early years and is well remembered as a member of the Show Committee, he was responsible for the printing of the Show Schedule since the first A.N.O.S. Spring Show in 1975. He was a Vice-President of Warringah Group from 1979 until he became President. He received their Meritorious Award in 1991. Whenever there was work to be done, Bob was there to do it. Volunteers where called for, to work on the native orchids in Stony Range, Dee Why, Bob was one of the first to respond.

Bob was a bricklayer and stonemason by trade and many have told me how proficient he was, even using the term an artist.

In World War II he served his country well.

His special love was for his native orchids and plants, his knowledge of these was extensive.

A great guy who lived life to the full. Friendly, jovial, outgoing and it was indeed, an enormous privilege to name him a friend.

He will be greatly missed and our native plants have lost a champion.

Our deepest sympathy is extended to his widow and his family.

No. 19: *Pterostylis grandiflora* R. Brown

Common Name: Cobra Greenhood, Superb Greenhood

Subfamily: Orchidoideae
Tribe: Diurideae
Subtribe: Pterostylidinae
Genus: *Pterostylis* R. Brown

Distribution: The genus *Pterostylis* occurs in Australia, New Zealand, New Caledonia and New Guinea. *Pterostylis grandiflora* is found in Tasmania, south-eastern Victoria, New South Wales and Queensland.

Notes: All *Pterostylis* are terrestrial orchids, but occasionally plants can be found growing on treefern trunks. *Pterostylis grandiflora* is a colony forming orchid, which can be found in flower between late autumn through to early spring. This is a cauline species, where a non-flowering plant produces a rosette of leaves above the ground, while a flowering plant has up to nine leaves on the flowering stem which produces a solitary flower. The flower is typical of a *Pterostylis* with the partial fusion of the lateral petals and the dorsal sepal to form the galea, which is up to 4cm long. The galea is upright for half its length before it curves forward and then downwards at the tip. The lateral petals flare towards the end of the galea and are usually red to brown. The lateral sepals are erect and the tips project well above the galea. The presentation and coloration of the flower makes this *Pterostylis* one of the most attractive greenhoods. The common name of cobra greenhood originates from the presentation of the flower, as the distinctly flared lateral petals give the flower a shape which is reminiscent of a cobra ready to strike. The labellum is narrowly filiform for half its length towards the tip and protrudes from the sinus of the lateral sepals. This extension past the sinus adds to the impression of the snake as it looks like the tongue.

Pollination: There is no recorded pollinator for this species. A few species of *Pterostylis* are reported to be pollinated by fungus gnats.

Conservation Status: This species is not under threat, although it is listed as rare within Victoria where it is only found in a few scattered areas to the east of Melbourne.

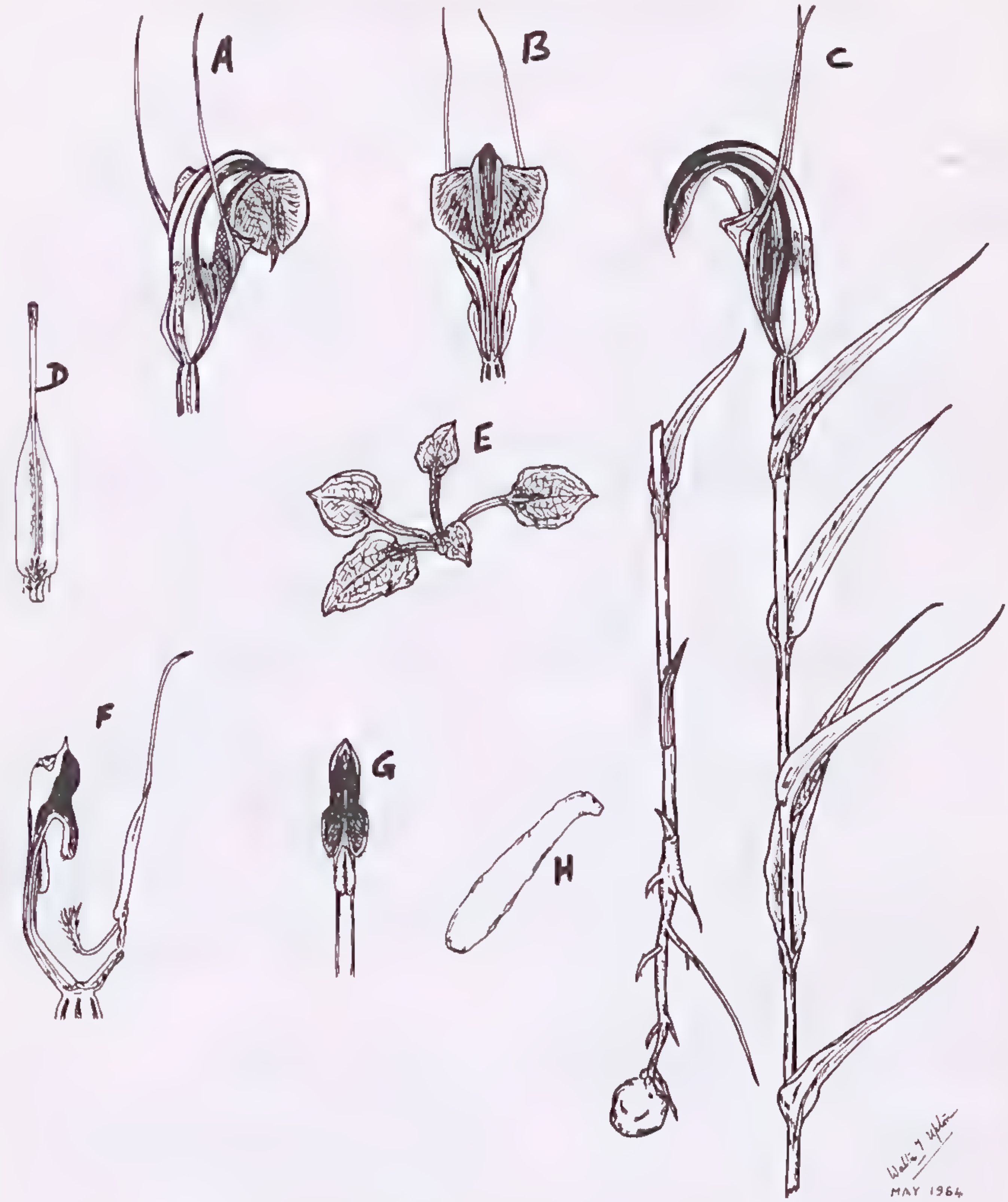
Culture: *Pterostylis grandiflora* is a colony forming terrestrial. These orchids grow well under 50% shade in a basic terrestrial orchid mix. They should be watered from mid January to late spring and the plants flower better if kept cool over summer.

Illustration: Painting: Illustrated are four flowering plants and two non flowering plants of *Pterostylis grandiflora.* The flowers show the flaring and red-brown colouration of the lateral petals. The two non-flowering plants show the rosette of leaves which remain near the soil surface and are just above the leaf litter.

Description: Tony Slater, 17 Dudley Street, Mitcham, Victoria 3132.

Illustration: Helene Wild, 56 Civic Parade, Seaholme, Victoria 3018.

Line Drawings and Captions: Walter T. Upton, P.O. Box 215, West Gosford, NSW 2250.



Pterostylis grandiflora **R.Br.**

Wakehurst Parkway, Narrabeen, N.S.W.

A. Flower, rear view	1X	E. Rosette of leaves	1X
B. Flower, front view	1X	F. Column and labellum, side view	2X
C. Flowering plant	1X	G. Column, front view	2X
D. Labellum	2X	H. Pollinia	approx. 16X

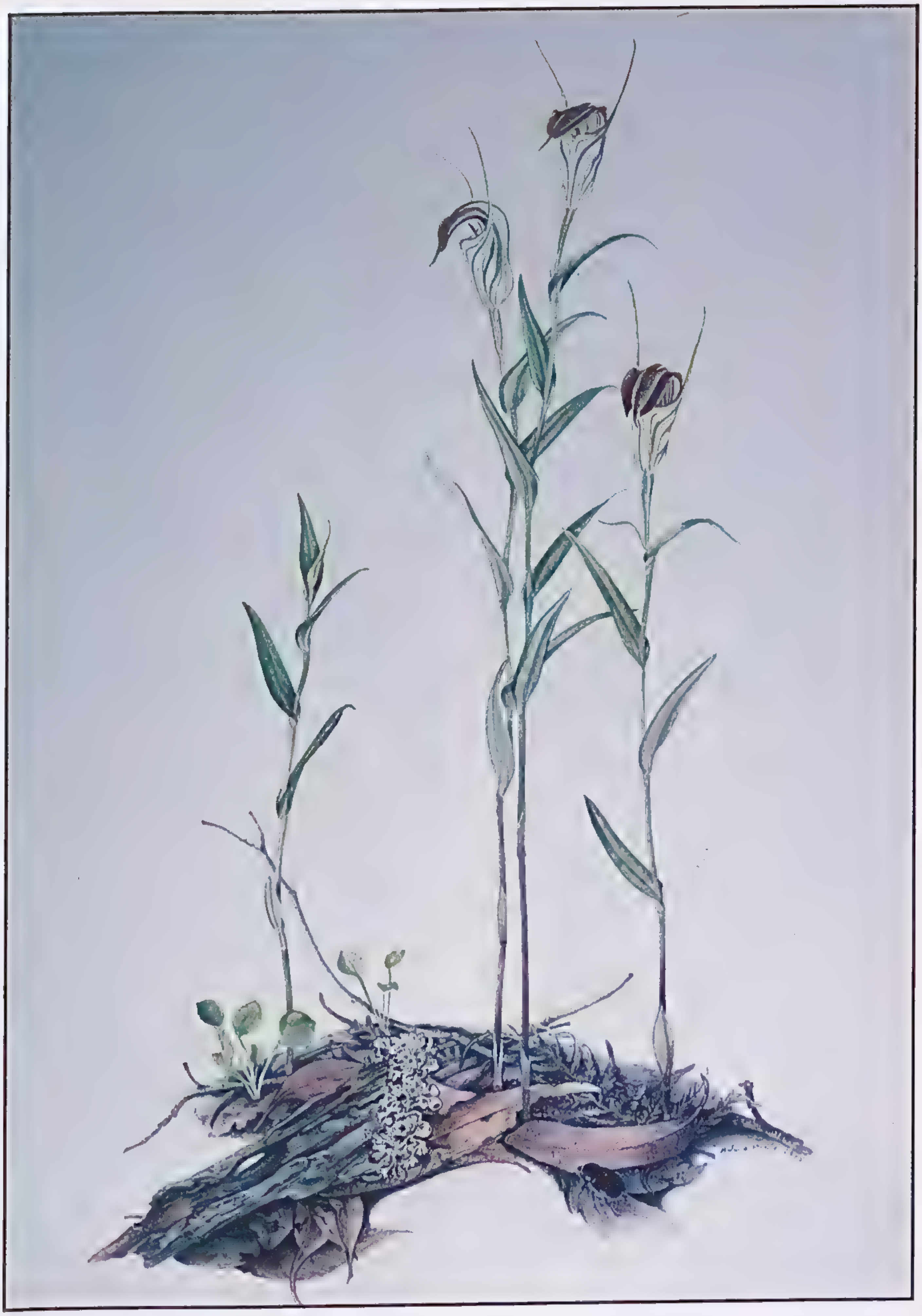


Plate 1: *Pterostylis grandiflora* R.Br.
From a painting by Helene Wild.

THIRD AUSTRALASIAN NATIVE ORCHID CONFERENCE AND SHOW — IT WILL BE SPECTACULAR!!

G. E. Carne
Conference Chairperson

The Native Orchid Society of South Australia (N.O.S.S.A.), has been working hard towards ensuring that the Third Australasian Native Orchid Conference and Show, will be long remembered as one of the most impressive and most significant Orchid Meetings ever staged in Australia. The 25 Australian and New Zealand groups that comprise the Australasian Native Orchid Society will together bring to Adelaide what is expected to be the largest and the most innovative and spectacular display of Australasian native terrestrial and epiphyte orchids and their hybrids ever assembled, with all areas of the Australasian region represented. Field trips will allow Conference delegates to see a large variety of South Australia's terrestrial orchids in their natural settings. Speakers of the highest calibre will deliver up-to-date papers on an exciting range of topics, over a full two-day period. The Australasian Native Orchid Conference and Show is offered only every third year and should not be missed! N.O.S.S.A. looks forward to providing a warm and genuine South Australian welcome to delegates from around the world.

Speakers from Australia, Papua New Guinea and New Zealand have been selected on the basis of specific expertise and public speaking ability. Speakers will include David Banks, Tad Bartareau, Andrew Brown, Malcolm Campbell, Lorraine Fagg, Ted Gregory, Wayne Harris, Ron Heberle, Neville Howcroft, Bruce Mules, Les Nesbitt, Helen Richards, Daryl Smedley, Phil Spence, Geoff Stocker, Wal Upton and John Woolf. Not all speakers have finalised their subject topics, but topics nominated at this time include: The Hot-Cold Mix of Australian Dendrobiums, Conservation of Orchids on a Bush Block, Growing Natives in Arid Areas, You Can Have a Darn Good Collection of Species Terrestrials, Australasian Species — Hybridising with New Guinea Dendrobiums from the Latouria Group, Hybridising with the Genus *Dendrobium* in Australia, Miniature Orchids of Australia, Specificity and Mutual Dependency in Pollination of Australian Epiphytic Orchids by Native Bees, The Evolution and Distribution of the Australasian Orchid, *Sarcochilus* Species in the Wild and the Latest Hybridisation, Aspects of Biology and Ecology of Western Australia's Native Orchids, Hybridising Between Australian and New Zealand Orchid Genera and Selected Orchids of Papua New Guinea — Notes on Habitat and Cultivation.

September is the best month to see native orchids in the bush near Adelaide. Some 100 species of terrestrial orchids occur in the Adelaide Hills area, making it one of the richest orchid areas in Australia. Local experts on South Australia's native orchids have offered their services as field excursion guides. Two formal excursions are being organised and many very exciting terrestrial orchid species will be seen. Additional informal outings, both before and after the Conference, are also being arranged.

The Conservation of our native orchids will be a much promoted theme of the 1996 Conference. It is hoped that Conservation Officers from all A.N.O.S. associated/affiliated societies will meet in Adelaide to maintain a conservation purpose and solidarity at national and international levels. A Conservation forum is planned for the Saturday morning of the Conference and a boardroom has been booked in which Conservation issues may be discussed throughout the Conference period. Industry and Government participation, sponsorship and support is being sought.

A Photographic Competition is being held in conjunction with the Conference and Show. All entries will be displayed at the Conference in a room specifically designed for such displays. Wouldn't it be great to have every Australasian orchid species represented in one form or another at the Conference! Paintings, ceramics, woodcarvings and other crafts depicting native orchids will be placed on display alongside the photographic entries. N.O.S.S.A. is finalising other displays and events that will add considerably to your enjoyment of the Conference. More will be said about these in the next issue of *The Orchadian*.

The Australasian Native Orchid Society encourages all orchid enthusiasts to attend the Conference and Show, to be held at the Flinders University in Adelaide, South Australia, from 26th to 30th September, 1996.

Caladenia rigida (Plate 8) has been chosen as the logo for the Conference. ✤

EVIDENCE OF LOW GENETIC DIVERSITY IN *DENDROBIUM MALBROWNII* DOCKRILL (ORCHIDACEAE)

I. K. Sharma and M. A. Clements
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ABSTRACT

Investigation into genetic variation determined by enzyme mobility amongst seedlings of the Australian rare and endangered endemic species *Dendrobium malbrownii* Dockrill was carried out using starch gel as a substrate. All the 10 enzyme systems analysed produced unique, consistent, reproducible banding patterns which were monomorphic at all loci suggesting very low genetic variation in this species of restricted distribution. Strategies to conserve this species and possible explanations for virtually no genetic diversity are discussed.

INTRODUCTION

Genetic diversity has a dual function within a rare species, that of preventing extinction and assisting to persist through environmental changes (Moran and Hopper, 1987). It also is informative as to the evolutionary history of the species and of useful conservation management strategies (Soltis *et.al.*, 1990).

There have been various investigations conducted, studying genetic variation through isozyme analysis within and in between various populations of a certain taxa. For example, it has been used extensively for studying genetic diversity among Australian *Eucalyptus* species (Moran and Bell, 1983), cycads (Ellstrand *et.al.*, 1990), *Eremaea* (Coates and Hnatiuk, 1990), European orchids (Arduino *et.al.*, 1995, Rossi *et.al.*, 1992), for identifying cultivars (Mielke and Wolfe, 1982), identifying hybrids (Parfitt *et.al.*, 1985) and for determining outcrossing (Chemda and Gazit, 1984). However, to date there have been limited surveys of genetic variability in any taxa of Australian Orchidaceae. The technique of electrophoresis was applied to study genetic variation among the progeny of a locally distributed, endemic, rare Australian orchid *Dendrobium malbrownii* Dockrill.

The species *D. malbrownii* (Fig. 1) is one of a number of Australian orchids with a restricted range considered to be vulnerable (rare and endangered category code 2V) (Briggs and Leigh, 1988). This species is found in rainforests along a few creeks, only in the McIlwraith Ranges, Cape York Peninsula (Lavarack, 1981). It is the only Australian member of an otherwise Papuan-Malesian group belonging to *Dendrobium* section *Monanthos* Schltr (Schlechter, 1914, Dockrill, 1969, Kores, 1989, 1992), which has more recently been treated at generic level (Brieger, 1981, Rauschert, 1984). This epiphytic or lithophytic species forms small grass-like clumps on thin stems (Plate 7), has dark green leaves, spreading and deeply notched at the apex with a solitary flower (Plate 5) (Jones, 1988).

The purpose of this study was to test the general hypothesis that a lack of genetic diversity is contributing to restricted distribution of *D. malbrownii.* Due to difficulties in obtaining plants from a broad geographical range (as increasingly few plants can be located), this study was conducted using plants from the Australian National Botanic Gardens.

MATERIALS AND METHODS

As it would be difficult and indefensible to acquire several hundred plants of *D. malbrownii* from the field. Seeds were collected after crossing (hand pollination) of certain plants (voucher No. 741420, 7806497, 731999, 760586) collected randomly and at different times from the wild populations) and grown in

Plate 2: *Dendrobium speciosum* in Lamington N.P. spectacular floral display. Photo: T. Slater

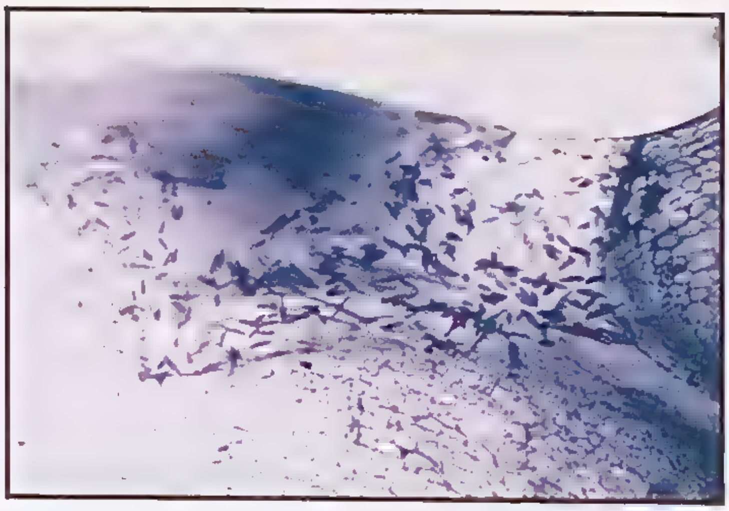

Plate 3: Longitudinal section of stigma of *Dendrobium speciosum*, stained with toluidine blue showing detached cells. Photo: T. Slater

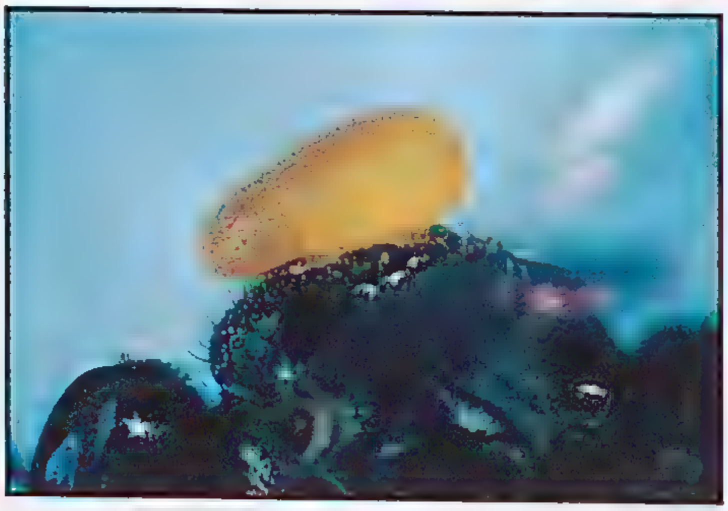

Plate 4: Pollina of *Dendrobium speciosum* var. *hillii* connected to the dorsal thorax of *Homalictus brisbanensis*. *Photo: T. Slater*

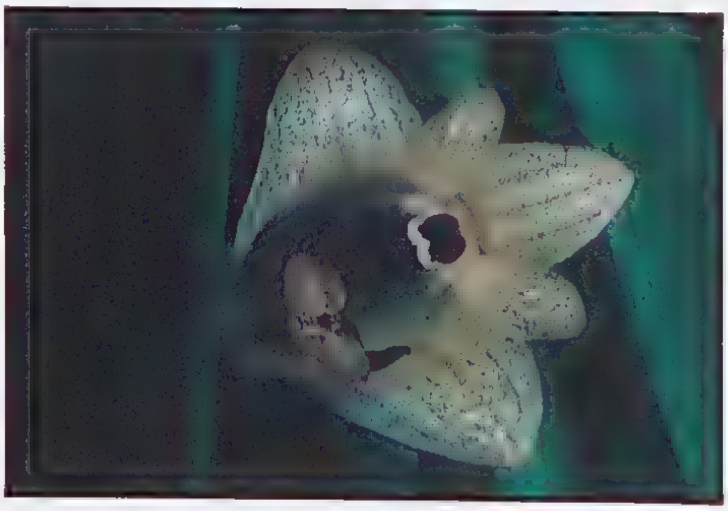

Plate 5: *Dendrobium malbrownii*. *Photo: I. K. Sharma*

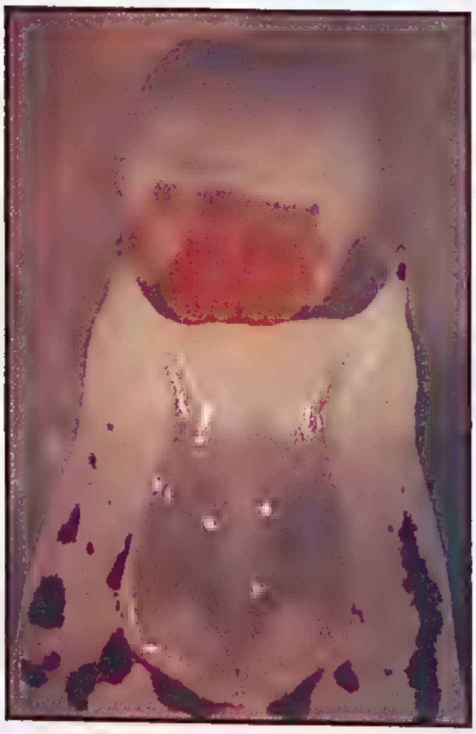

Plate 6: Ventral view of *Dendrobium speciosum* column, showing stigmatic cup which contains a copious amount of mucilage. Photo: T. Slater

Plate 7: *Dendrobium malbrownii* habit. Photo: I. K. Sharma

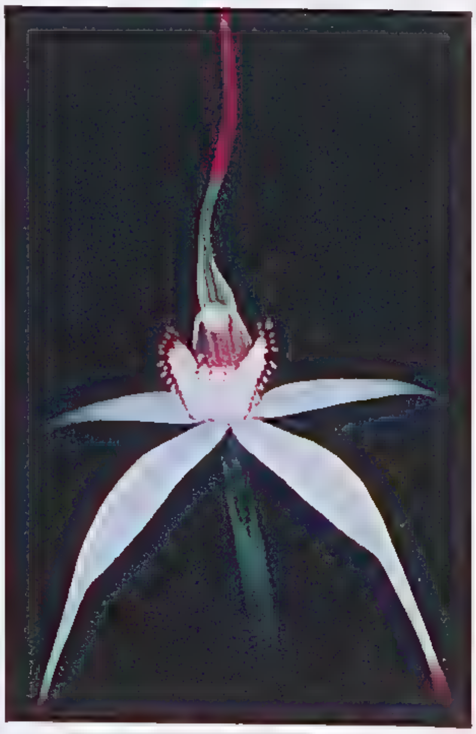

Plate 8: *Caladenia rigida*. Photo: G.E. Carne

the glasshouse of the Botanic Gardens. Selfing of these plants failed to produce seeds, the flower falling from the plant within two weeks after pollination. Seedlings were raised asymbiotically in tissue culture containers following the methods described by Arditti (1977) and Arditti and Ernest (1993) for use in electrophoresis. One seedling (5–10mm) per sample (200 in total) was macerated in leaf extraction buffer (Phosphate buffer pH 7.5, with 10% polyvinylpyrrilidone (mol. weight, 40,000) and 1mg/ml of dithiothreitol), homogenate absorbed on to 2.5 x 2.5mm chromatography paper wick and then applied to a starch gel. Starch gel and enzymic stains were prepared according to the method of Conkle et.al. (1982). The 10 enzyme systems assayed in the present investigation were: Malate Dehydrogenase (MDH, EC 1.1.1.37), Phosphoglucose Isomerase (PGI, EC 5.3.1.9), Phosphoglucose Mutase (PGM, EC 2.7.5.1), Aconitase (ACO, EC 4.2.1.3), 6 Phosphogluconate Dehydrogenase (6 PGD, EC 1.1.1.44), Shikimic Acid Dehydrogenase (SDH, EC 1.1.1.25), Isocitrate Dehydrogenase (IDH, EC 1.1.1.42), Uridine Diphosphogluconic pyrophosphatase (UGP, EC 3.4.11.2), Diaphorase (DIA, EC 1.6.4.3), Leucine Amino Peptidase (LAP, EC 3.4.11.1).

The electrophoresis was conducted at 60mA for 5h at 4°C for the duration of the run. After the run, the gels were trimmed and sliced into 2mm slices for 10 enzyme assays following Weeden and Wendel (1989). Each slice was assayed in a polystyrene fray at 37°C until dark bands appeared. Bands were scored, migration measured and gel fixed in 50% ethanol for a week.

RESULTS AND DISCUSSION

Seedlings were analysed for 10 enzyme systems and we detected no variation amongst them. All the 13 loci namely: GPI, PGM–1, PGM–2, GPI–1, GPI–2, GPI–3, ACO, 6 PGD, SDH, IDH, UDP, DIA, LAP, were found to be invariant and monomorphic. Enzymes such as like PGI, PGM, 6 PGD, MDH all are known to be highly polymorphic in other species (Chaparro *et.al.*, 1989) including other species of *Dendrobium* (section Dendrocoryne) (unpublished, in preparation). Isozyme banding patterns, migration distance observed were identical in all the seedlings assayed for all the 10 enzyme systems which indicate there is no heterozygosity present and all the seedlings used in the present investigation are genetically identical.

Lack of genetic variability in *D. malbrownii* is not unusual. Even the most variable population of *Halocarpus bidwillii* Moq. showed very little variation when compared with genetic variation among other conifers (Hamrick *et.al.*, 1981). Genetic variability was zero among 59 loci examined in two populations of *Pinus toryana* Parry ExCarr. (Ledig and Conkle, 1983). Populations of *Chrysoplenium iowense* Rydb. were also found to have no genetic variation at eight loci, though a single variant was found later (Schwartz, 1986). There are many other plant species, when examined electrophoretically were found to be monomorphic, e.g. *Howellia aquatilis* (Lesica *et.al.*, 1988), *Bensoniella oregona* (Soltis *et.al.*, 1992), *Trillium nivale* (Bayer *et.al.*, 1987), *Pedicularis furbishiae* (Waller *et.al.*, 1987).

The absence of genetic variation raises the question of how this particular species could have plants of virtually one genotype. One explanation for virtually no genetic variation is that plants could have been migrated to this area by seeds which must have had a very low genetic range. Continuous inbreeding among themselves could have led to one genotype. Another hypothesis suggested by Lavarack (1981) is that the rainforest of the Cape York Peninsula and Papua New Guinea (PNG) were joined together before the climate change which might account for the present similarities of the flora including orchids. Over a period of time the rainforest in the Cape York was depleted and isolated from PNG. Within this depleted region continuous inbreeding among themselves and relatives of this species, for many generations, could have led to the divergence and establishment of *Dendrobium malbrownii* as distinct species as well as low genetic variation. (There is a requirement for two clones of *D. malbrownii* to allow seed set which suggests some variation implicit in the population but not detected by electrophoresis).

Nei *et.al.*, (1975) reported the effect of "bottleneck" on heterogeneity and their conclusion was that after a drastic reduction in population size, one could expect a reduction in heterogeneity over a period of many generations with mutation being the only means of increasing variation. Populations of a species with restricted distribution maintain lower genetic variation than populations of widely distributed plants (Gottlieb 1973, Babbel and Selander 1974).

Genetic diversity is of paramount importance to a species' ability to withstand variation in the environment. In cases like *D. malbrownii* where we were unable to find a variable genetic marker, it is extremely difficult to formulate long-term conservation strategies that aim at diversifying the species. However, with the advent of molecular techniques like RAPDs or DNA sequencing it might be possible to find genetic diversity by examining part of the genome of a rare species.

Lack of heterozygosity at the loci examined does not mean that genetic variation is not present at other loci. The present results reflects the genetic structure of *D. malbrownii,* but it does not reveal relationships between isozyme analysis and quantitative traits (draught resistance, photosynthesis, etc.) which may be more important for the long term survival of a species (Hamrick 1983).

Looking at the genetic diversity and endemic nature of this particular species it may lack adaptability and is likely to be more sensitive to ecological change and thus prone to extinction (Stebbin 1950). Our efforts should be drawn towards locating more plants of *D. malbrownii* with different genetic make up. By bringing these plants into a suitable habitat and by providing a natural course of cross pollination, future progeny may result in greater genetic diversity and be able to survive the predictable environmental changes. Along with this, it is also important that we should devise a conservation programme to protect this species from becoming extinct. It could include:–

(1) steps to protect further reduction in the number of existing plants until a detailed analysis of quantitative traits and population biology are conducted;
(2) protection of sites which appear to have the best potential for providing a long term stable habitat (remnant rainforest in the McIlwraith Ranges. The species could be introduced in other suitable habitats of large rainforest such as shore surrounding the Daintree River area, but need very careful consideration;
(3) germination of seeds asymbiotic/symbiotic, and
(4) tissue culture, which offers the advantage of producing a large number of plants which can be released to a suitable habitat;
(5) development of *ex situ* germplasm stores, e.g. living plants in the Botanic Gardens, seeds in cryogenic storage.

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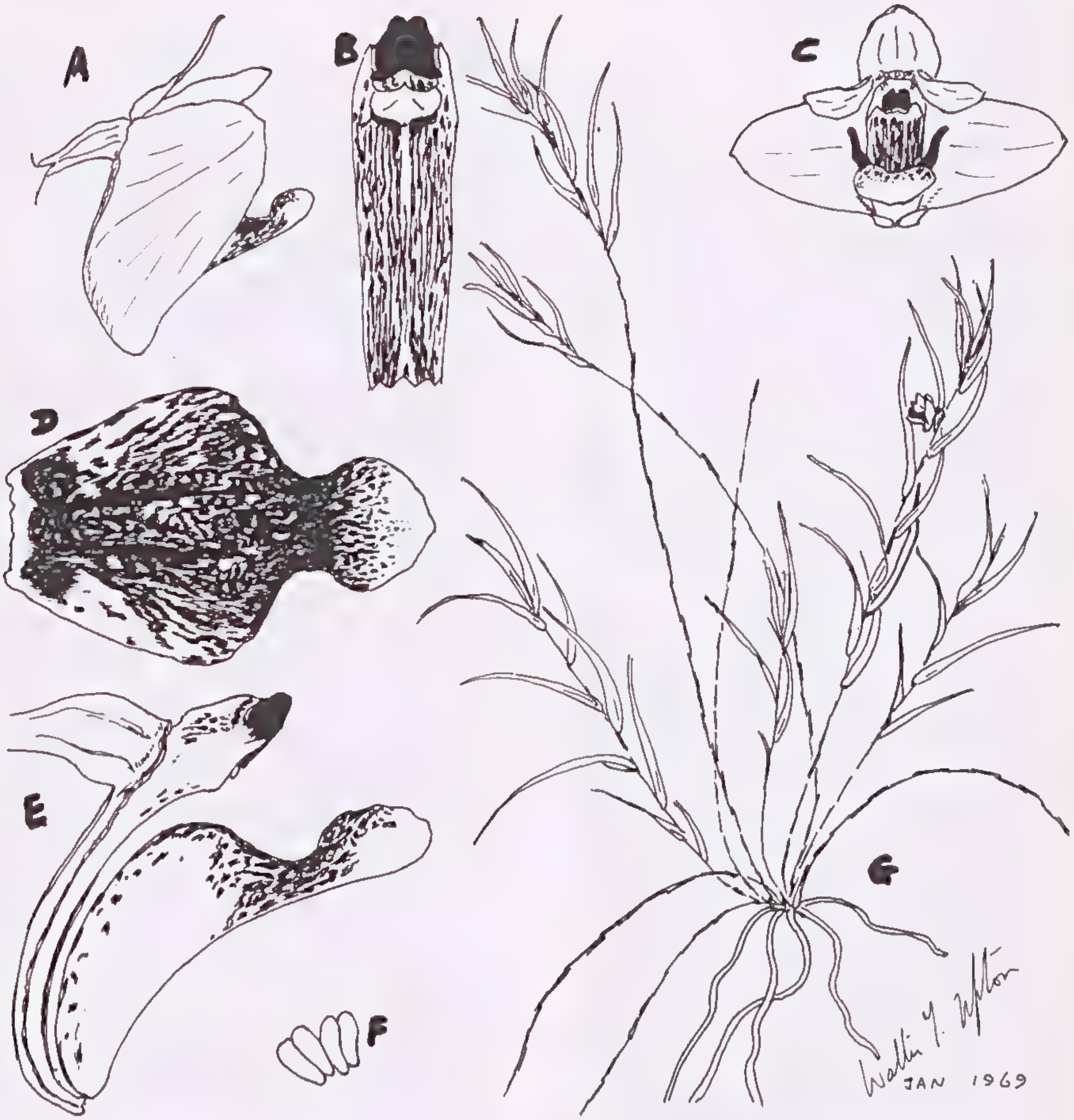

Fig. 1 – ***Dendrobium malbrownii*** Dockr.

From the McIlwraith Range in Cape York Peninsula

A. Flower, side view	4X
B. Column, front view	8X
C. Flower, front view	4X
D. Labellum, pressed flat	8X
E. Column and labellum, side view	8X
F. Pollinia	approx. 8X
G. Plant	⅓X

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THE STIGMA OF *DENDROBIUM SPECIOSUM*: AN UNUSUAL STRUCTURE WHICH HAS SPECIFIC ROLES IN POLLINATION AND REPRODUCTION

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SUMMARY

The stigma of *Dendrobium speciosum* is a sunken cup on the ventral surface of the column which contains a copious amount of viscid material. This viscid material contains a large number of detached cells floating in a mucilage which these cells secrete.

The stigma does not have a distinct rostellum and the pollinia do not have any attachments to aid their attachment to pollinators. The pollination of this species was monitored to determine how this stigmatic structure assists the transfer of the pollinia between flowers. The stigma was found to provide a smear of sticky glue to attach the pollinia to the pollinator.

The pollinia contain a large number of pollen grains and this stigmatic structure which produces a large amount of mucilage, assists in the receipt and support of the pollinia. The mucilage of the stigma surrounds the large pollen mass and then aids in the germination and growth of the pollen tubes.

INTRODUCTION

D. speciosum Sm. is generally considered to be one of Australia's most attractive orchids and has received attention from botanists and botanical artists since soon after European colonisation (Bauer and Lindley, 1830–1838; Slater, 1994). It is a variable species which occurs from northern Queensland to eastern Victoria and can be found growing as an epiphyte in the subtropical rainforests or as a lithophyte on cliff faces and in open woodlands.

The floral display of this orchid can be quite spectacular. Single flowering plants can produce numerous inflorescences, with up to 280 flowers on each inflorescence. Consequently individual plants can produce thousands of flowers (Plate 2). Although this species produces so many flowers per plant very few of the flowers produce seed pods. Fitzgerald (1891) noted this low pod set and Charles Darwin even referred to *D. speciosum* as an orchid that failed to have its flowers fertilised (Darwin, 1904). Whilst investigating the pollination and reproductive biology of this species to determine the cause of this low pod set, the structure of the stigma was found to be different from any other plant tissue that had been previously described (Calder and Slater, 1985). This tissue was found to have essential roles in the pollination (Slater and Calder, 1988) and reproduction of this orchid (Slater, 1991).

THE STRUCTURE OF THE STIGMA

The stigma is a sunken cup on the ventral surface of the column which contains a copious amount of viscid material (Plate 6) and was determined to be mature and receptive for pollen for the life of the flower. Microscopic examination of the stigmatic surface determined that the viscid material contained a large number of detached cells floating in the mucilage (Plate 3) using a fluorescent stain, these cells were found to be alive and functioning.

Under a high powered light microscope the detached cells were shown to have a large nucleus and numerous amyloplats (plastids containing starch). Observation using a scanning electron microscope showed the general shape of the cells to be ovoid and they also had a number of external pointed projections. Using a transmission electron microscope the cells were seen to contain a large number of the organelles important in secretion; mitochondria, golgi bodies and endoplasmic reticulum. Vesicles involved in secretion were seen at the golgi bodies, at the plasmalemma and leaving the cell. The external projections contained the remains of the intercellular connections and were most likely formed as the cells produced the copious amount of secretion which pushed the cells apart (Slater and Calder, 1990).

The description of this stigmatic tissue, detached cells suspended in a copious amount of secretion, has created a lot of interest internationally. The work was followed by research groups in Denmark (Johansen, 1990), England (Clifford and Owens, 1990), Germany (Dannenbaum *et.al.*, 1989) and Canada (Yeung, 1988), who have worked on orchid stigmas.

Since the orchid family was described by Lindley (1830–1840), it has been subdivided by characters of the anther and pollinarium (Dressler, 1981). While Burns-Balough and Funk (1986) concentrated on characters of the androecium, they also used some characters of the gynoecium. The research groups investigating the stigma will determine how widespread within the family this stigmatic structure is and will also give a deeper insight into the evolution of this large and intriguing family of plants by understanding their intricate pollination and reproductive relationships.

POLLEN TRANSFER AND THE STIGMA

Little was known on the function of the orchid stigma, although the role of the rostellum in pollen transfer has been well documented (van der Pijl and Dodson, 1966; Dressler, 1981). The rostellum is a modified part of the stigma which has a role in the transfer of the pollinia. The rostellum can be a simple or well developed structure to ensure that the pollinator comes into direct contact with it.

D. speciosum does not have a distinct rostellum, although the stigma is located just below the anther. The pollinia are available to potential pollinators when the anther cap is hinged back (Plate 6). The pollinia are naked, they are not sticky and they do not have any attachments to aid their attachment to pollinators. So the mechanism of pollination in *D. speciosum* was investigated to determine the role of the stigmatic structure in pollen transfer.

Previously, three insects had been described as possible pollinators: the dendrobium beetle (Fitzgerald, 1891), hoverflies (Adams and Calder, 1982) and native bees (Smythe, 1970; Jones, 1983). Although these insects were considered, they were not positively identified as pollinators. To determine the role of the stigma in pollen transfer, the behaviour of these insects was noted on the flowers. The dendrobium beetle was found to eat the plants and flowers and did not transfer pollen from one flower to the next. Hoverflies visited the area of a flower but never landed and did not transfer the pollen.

A range of native bees were observed visiting and pollinating the flowers during sunny and wind-free conditions. They were attracted to the plant by the large floral display, which in sunlight produces a strong sweet aroma. The aroma is produced from glands scattered over the petals and sepals. Individual flowers have a central area of ultra-violet reflectance which guides the bees to the floral tube formed by the labellum and the column. Although the flowers produce the sweet aroma suggesting that the flowers contain nectar, no reward was found to be produced for the pollinators (Slater and Calder, 1988).

The bees would land on the flower and then enter the floral tube in search of food. They would then reverse from the flower immediately and proceed to another flower. If a bee was an appropriate size for the floral tube, it would come into contact with the stigma and obtain a smear of the stigmatic liquid onto which the pollinia would drop as the anther cap was hinged back. The pollinia could then be seen on the dorsal thorax of the bee attached with a smear of stigmatic liquid (Plate 4), ready to be positioned into the stigma of the next flower it visited. *Homalictus brisbanensis* was identified as a pollinator of *Dendrobium speciosum* var. *hillii (D. tarberi)* (Slater and Calder, 1988).

The native bees collected from the flowers varied from 4 to 10mm long and they had a variety of social types and general food collecting behaviours, but they were all seen to behave in a similar fashion on the flower. The size of the bees in relation to the size of the floral tube was determined to be the important factor (Slater and Calder, 1988). Consequently as the size of the flower changed, a different sized bee would be required to pollinate the flower.

The unusual stigmatic structure of this orchid was found to have a vitally important role in pollen transfer by providing a smear of sticky glue to attach the pollinia to the pollinator.

STIGMATIC FUNCTIONS FOLLOWING POLLINATION

The typical functions of the stigma in sexual reproduction were also investigated to determine the roles of the detached cell stigma in pollen attachment, hydration, germination and pollen tube growth.

Pollination of *D. speciosum* occurs when the pollinia from one flower are placed into the stigmatic cup of a flower on another plant. The pollinia are approximately 1mm long and contain over 500,000 pollen grains. Each pollinium is over 100 pollen grains in depth. The pollinia fit neatly into the stigmatic cup and the mucilage and stigmatic cells then surround the entire pollinia, which effectively increases the surface area of the stigma.

Following pollination the pollinia break apart as the pollen grains disassociate from each other. The grains progressively hydrate and germinate from the outside of a pollinium to the inside. The stigmatic mucilage is essential in the hydration and germination of the pollen. The detached cells of the stigma located near the entrance ot the stylar canal lose the starch from the amyloplasts and may be providing food for the growing pollen tubes (Slater, 1989; 1991).

Thus the detached cell stigma, which produces a large amount of mucilage, has an essential role in the receipt and support of the pollinia. Firstly by surrounding the large pollen mass and then by aiding in the germination and growth of the pollen tubes.

CONCLUSION

The detached cell stigma is a distinct and highly specialised tissue type, which has probably evolved in association with the large pollen mass.

The causes of the low pod set observed by Fitzgerald (1891) and Darwin (1904), were determined to be the combination of the self-incompatibility of the plant, the lack of reward provided for pollinators and the specific weather conditions in which the bees visit. Coupling these factors with the behaviour of the bee on an inflorescence, would result in few successful pollinations. A bee would systematically enter and pollinate four to six flowers on an inflorescence and then fly off in search of food. Only in the rare event that a bee would visit one plant and then a second in its search for food would a successful cross-pollination take place (Slater and Calder, 1988).

It may appear that the reproductive strategy of *D. speciosum* is inefficient with only one flower out of 280 producing a mature seed pod, but as the pollinia contain over 500,000 pollen grains and the seed pod can contain up to 500,000 seeds, then this is a very effective method of reproduction (Slater, 1989).

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❦

A.N.O.S. AND THE INTERNET

Ruth Rudkin
18 Lyle Avenue
Lindfield, N.S.W. 2070

In June of this year, A.N.O.S. Council received a letter sent to *The Orchadian* by Nola Rennie of the Southern Cross University. As a lover of Australian native orchids, but unable to attend orchid society meetings, she suggested that she and others in her position, communicate by e-mail. Further she suggested that perhaps it would be possible through Internet to open a "page" on World Wide Web. After some discussion it was left to me to make further enquiries.

The further enquiries lead me to contact Tony Nolan at Kuringai Campus of U.T.S., where I was shown some of the wonders of the Web. I left a message on it and received several replies. One particular one was from Shah Yussof of University of N.S.W. with whom I got into contact. He has given me much help after I bought myself a more up to date computer. In the process I heard of "sites", "list servers", "pages" and so on. In fact everybody already on Internet that I contacted, including Nola Rennie of course, was anxious to help.

Finally, at the A.N.O.S. A.G.M. at the end of July, I gave my report. Fortunately Graeme Bradburn was present. He was already getting into the WWW and was able to give more information. He even invited all those interested to go to his place and see for themselves the kind of services available. At the September meeting of Council, it was reported that Graeme was prepared to initiate a "page" for A.N.O.S. on the Web. This would give basic information on the aims and objectives of A.N.O.S., further information on the various A.N.O.S. Groups, *The Orchadian,* shows and so on. Orchid enthusiasts around the world would get more information on Australasian orchids and their culture. Furthermore it would be a great asset to the Native Orchid Society of South Australia by giving information about the Third Australasian Native Orchid Conference and Show in Adelaide next year. It is thought that the "page" could be established by November, 1995. See you there?

The address on the Web is:–
http://www.ozemail.aust.com:80/~graemebr/ ❦

DANHATCHIA, A NEW GENUS FOR *YOANIA AUSTRALIS*

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and Eric A. Christenson
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Sarasota, Florida, 34236, U.S.A.

ABSTRACT

Examination of specimens of *Yoania australis* Hatch from New Zealand reveals it to represent a new genus, *Danhatchia* Garay and Christenson of the Subtribe *Goodyerinae.*

Saprophytic orchids are rather difficult to place in the ever changing phylogenetic and/or systematic arrangement of the orchid family since, to a great extent, they are survivors in cul-de-sacs of evolutionary experimentations. In early 1963, Edwin D. Hatch consulted Garay at the Orchid Herbarium of Oakes Ames in connection with the possible generic assignment of a new saprophytic orchid found in North Auckland Peninsula, New Zealand. At that time he provided only drawings of the plant and of floral details. Based on that information Garay suggested the Himalayan and Japanese genus *Yoania,* primarily because of the general habit of the plant, especially the subterranean branching rhizome, since information on the nature of the pollinia was not available. Thus *Yoania australis* was born. At that time Hatch was justly hesitant to include his new finding simply in *Yoania* due to the two pollinia in the flowers, instead of the four described for *Yoania.* So he proposed the Subgenus *Tarairea* for this disjuct species.

Many years later, in September 1978, Mr Hatch sent specimens to Garay and an examination of them provided important new information which drastically altered the generic placement of this unique plant. The soft and fragile pollinia with a small, globular viscidium attached to a bidentate rostellum are characters of the Subtribe *Goodyerinae* rather than those of the Tribe *Cymbidieae* where the genus *Yoania,* which is characterised as having bipartite, sessile, waxy pollinia situated on a large, quadrate viscidium, belongs. Our findings confirm a similar observation previously made by Moore and Edgar in 1970.

In reviewing the genera of the Subtribe *Goodyerinae* we find that this unique plant is rather near to another saprophytic genus from Asia, namely *Chamaegastrodia* Makino and Maekawa, especially resembling in habit *C. poilanei* (Gagn.) Seidenf. and Rao. It differs from *Chamaegastrodia,* however, in the resupinate flowers, in the structure of the lip which is basally adnate to the sides of the column, creating a small, saccate cavity and in the short, bidentate rostellum which is triangular in outline. Because of these characters together with the saprophytic habit this singular plant represents a hitherto undescribed genus which we wish to name most fittingly after its original author.

Danhatchia Garay et Christenson, gen. nov.
Syn.: *Yoania* Subgen. *Tarairea* Hatch in Trans. Roy. Soc. N. Zeal. Bot. 2(14): 185, 1963.

Sepala similia, concava, extus glandulosa; petala angustiora; labellum basi columnae breviter adnatum, valde concavum seu naviculare, basin versus aliquantum saccatum et intus utrinque subulato-echinatum; columna erecta, paululo arcuata, sursum dilatata; stigma amplum, orbiculare, marginatum; rostellum in ambitu triangulum, apice bidentato-excisum; anthera dorsalis, erecta, bilocularis; pollinia 2, mollia, viscidio parco subgloboso affixa.

Plantae saprophyticae; rhizomate subterraneo, prorepenti, ramoso; caulibus erectis, glanduloso-pubescentibus, laxe plurivaginatis, apicem versus laxe paucifloris; bracteis vaginis caulium simillimis; floribus semiapertis, resupinatis; ovario ovoideo, sessili, parce glanduloso.

Sepals similar, concave, glandulose externally; petals similar to sepals but somewhat narrower; lip basally adnate to the sides of column for a short distance, very concave or navicular, towards its base slightly saccate, inside the involute base prominently subulate-echinate; column erect, slightly arcuate, somewhat widening above; stigma large, orbicular, marginate; rostellum triangular in outline, bidentately excised; anther dorsal, erect, 2-locular; pollinia 2, very soft and fragile, united by a subglobose viscidium.

Plants saprophytic with subterranean, branching rhizome; stem erect, glandulose-pubescent, intermittently covered with several, inflated sheaths, towards the apex laxly few-flowered; bracts undifferentiated from sheaths; flowers resupinate with the lateral sepals somewhat spreading; ovary sessile, sparesely glandulose.

Species singula, adhuc nota, Nova Zelandia incola.

Typus generis: *Yoania australia* Hatch =

Danhatchia australis (Hatch) Garay et Christenson, comb. nov.

Basionym: *Yoania australis* Hatch in Trans. Roy. Soc. N. Zeal. Bot. 2(14):185, 1963.

TYPE: New Zealand: North Auckland Peninsula, Mt Auckland (Glorit). Dec. 24, 1962. R. and J. Beever s.n. (AK). Holotype not seen!

The plants, as was noted by St. George and McCrae, are autogamous. They are found always in close association with taraire [*Beilschmiedia tarairi* (A. Cunn.) Benth.], a tree in the avocado family, Lauraceae. *Danhatchia australis* is saprophytic/parasitic on a mycorrhizal fungus *(Lycoperdon perlatum)* of taraire (Campbell, 1970).

Excellent colour photographs of this unique plant and its habitat may be found in Johns and Molloy (1983: 62–63).

ETYMOLOGY

It is a privilege as well as a great satisfaction to dedicate this new genus to Mr Edwin Daniel Hatch, F.L.S., the most knowledgeable orchidologist in New Zealand, from whose pen, since 1945, over 40 scientific publications have elucidated our understanding of all the orchids known to be native as well as adventive to New Zealand.

ACKNOWLEDGEMENT

We wish to thank Mr Edwin D. Hatch for providing specimens of the rare *Yoania australis* as well as for colour slides of living plants and floral details taken by Mr S. N. Dunro.

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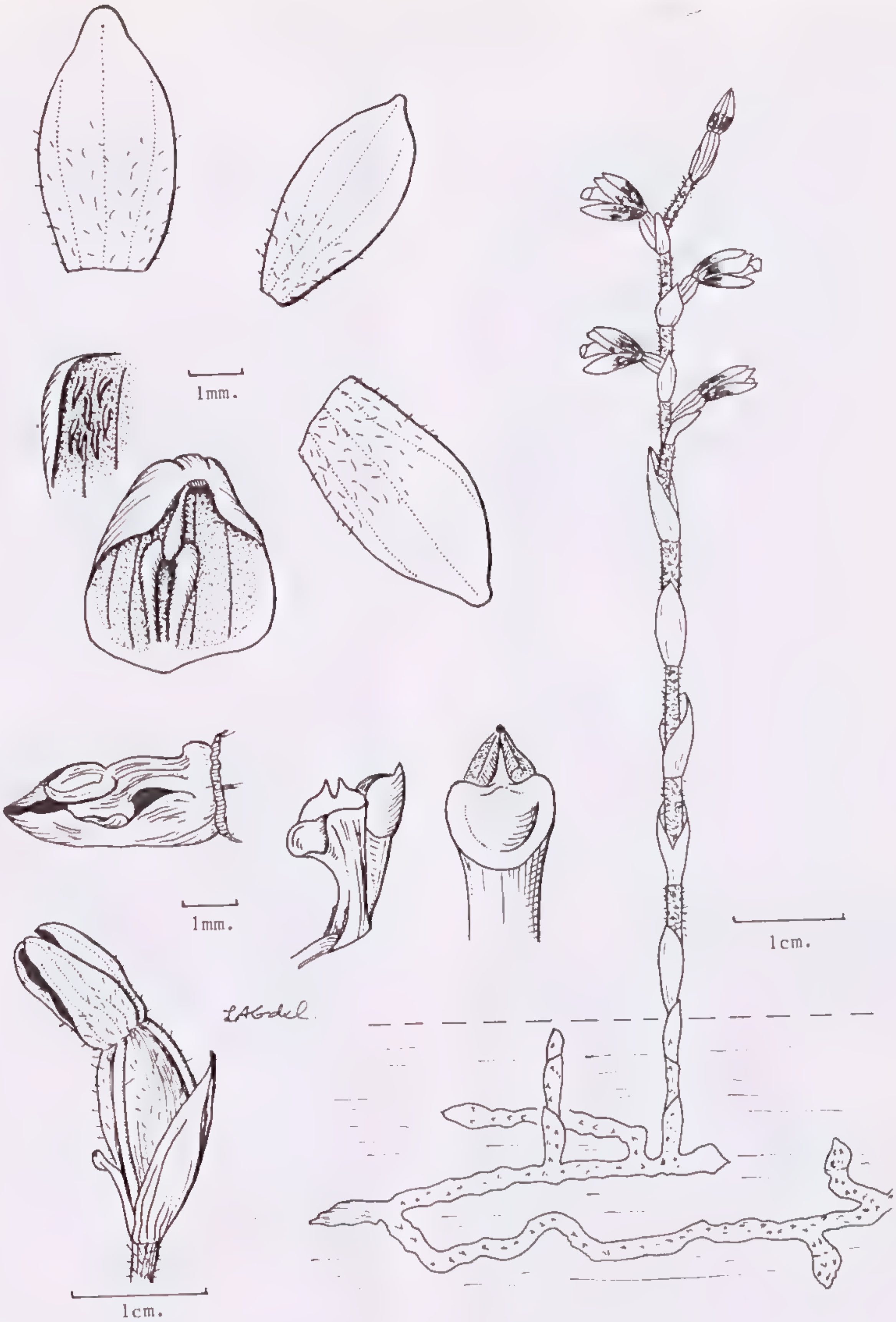


Danhatchia australis (Hatch) Garay and Christenson.

General habit of plant redrawn from Hatch in Trans. Roy. Soc. New Zealand, Bot. 2(14):186, 1963. Floral details drawn from a herbarium specimen collected at the type locality, Glorit by A. D. Hatch s.n. on 5th January, 1964.

COMMENTS ABOUT THE NEW TAXONOMY — IN REPLY TO Dr C. BOWER

Alick W. Dockrill
P.O. Box 127, Atherton, Qld. 4883

I was interested in Dr Bower's "In Defence of the New Taxonomy" in *The Orchadian* 11(8):356–357 (1995) and I congratulate the editor of *The Orchadian* for publishing different points of view. I have no desire to enter into a slandering match which would benefit nobody nor *The Orchadian,* but as Dr Bower's article is directed specifically at me I feel that a reply is called for.

Before proceeding I wish to advise that I attended a lecture on species determination in *Chiloglottis* by Dr Bower at Maryborough in May this year and was impressed by the sincerity of the man and the thoroughness of his investigations. On the other hand, for him to state, in *The Orchadian* article, that "the new taxonomy" generates anger within me (and some others) and that I and many others consider that the last word on taxonomy was uttered sometime prior to 1980, indicates that he has missed the mark entirely. I fully realise that some previously overlooked species have been brought to light since 1980 and that the identity of some others has been corrected and this has been a tremendous contribution by modern taxonomists. On the other hand, some of the newly described species **are** very difficult for the layman and others to comprehend and, naturally, they feel some doubt about these.

I have not heard that God has shouted from above: "A species shall be so and so". The "new taxonomy" implies and is in fact, a newly conceived conception of taxa, in particular species and a taxon (sort, kind or whatever term one wishes to use) **can** be proven to conform (or otherwise) to the **newly conceived** criteria; but to state that this is undeniable proof of specificity and that a conflicting point of view is not possible smatters of the dictatorial rather than scientific attitude and triggers off alarm signals.

Almost all of us have observed that almost all forms of life (particularly *Homo sapiens*) **are** variable. At what stage of variation things become different taxa is the contentious matter. In the past this was left to the discretion of the botanist, whether professional or part-time amateur, who assessed the matter in the light of his understanding of the genus and the realisation that what constitutes taxa differences in one genus or group of genera may not necessarily do so in some other genus or group of genera (e.g. *Dendrobiinae* as compared to *Sarcanthinae*) or even rarely by intuition (and this latter not by modern taxonomist which Dr Bower accused me of saying). When his findings, whether new taxa or revised interpretations, were published the heading of his article was either prefixed by "A Proposed . . ." or this was inferred which was an admission that the work should be scrutinised and that other interpretations were possible. It is a requirement, under recommendations of the International Code of Botanical Nomenclature, that names of taxa be suffixed by the author's name, usually in an abbreviated form and the author's name actually forms a part of the name of the taxon and is required to be included by any botanist referring to the taxon. This proviso was required in the knowledge that others may have called other taxa the same name or that other interpretations of the one taxon, in the broad sense, are possible. This, of course, is again an admission that variations of interpretation **are** possible.

Some modern professionals, such as Dr Bower in the above mentioned article, tell us that the main criteria for determining specificity are, in the case of *Caladeniinae,* pollinator specificity (and elsewhere, that in this and other subtribes geographic isolation and habitat are also very important). If a person on a field excursion to some reserve wishes to identify specimens it would be a relatively simple matter if there were considerable distinguishing features; but if one is required to establish what pollinators are involved and wait for insects to come along seeking fun or food, capture them and with equal difficulty identify them from the insect book brought along for the purpose, not much time is going to be left for other activities on the day. In the case of other subtribes, genetic analysis is given as the key deciding factor. Again if considerable distinguishing features are evident it would be a relatively simple matter to identify the specimens; but if a recourse to genetic analysis was required and a microscope and gene analysing equipment brought along by the poor overburdened person, a lot of the pleasure of the excursion would be lost. In any case, as far as genetic analysis is concerned, chromosome counts were at one time hoped to be the answer, but if my memory serves me correctly, subsequently it was found to be not completely reliable as again variations, in the manner of some quite strange and unexpected readings, cropped up from time to time. As far as other branches of science are concerned, it may be possible to prove that different taxa show different readings (and indeed DNA "fingerprints" vary from one individual to another), but again what degree of differences is necessary to separate things at the genus level?

Dr Bower's statement, on the strength of his experiences with only *Pterostylidinae* and *Caladeniinae* and in particular *Chiloglottis*, that "there is no reason to think that the situation with epiphytes is any different", is hardly the scientific approach. And I still believe that it would be well for "new taxonomists" to look also at relationships and not to be obsessed with finding new species.

✻

YES! WE DO GROW EPIPHYTES IN SOUTH AUSTRALIA

Reg Shooter
5 Dianne Place, Grange, S.A. 5022

Whenever I'm in orchid company away from home and I mention that I am from Adelaide the inevitable retort is, "oh, you grow those terrestrials don't you?"

Well it's true we do grow terrestrials and very well, but we also grow a large number of epiphytes, particularly the dendrobiums, *Sarcochilus* and cymbidiums. In fact there are many more epiphytes than terrestrials in cultivation in growers' collections in S.A.

We have to work at it a bit harder than the eastern states, basically because of the climate. In the eastern states the summers are warm and wet with cool and dry winters. In S.A. the opposite occurs. Hot, dry summers and cool, even cold with the occasional frost, wet winters. However, with attention to detail, conditions can be easily created without too much expense.

A simple shadehouse with 50% shade at one end and 70% at the other with facilities for providing a solid plastic cover during the wet winters would be ideal. An overhead misting system for creating humid conditions in the summer months also helps to duplicate their natural habitat.

Much has been said about the quality of Adelaide water, comments such as, "you don't have to fertilise in Adeliade, all the fertiliser you need is in the water." Well this may have been the case several years ago but with the filtration, etc., the water today is quite acceptable. I find that by filling a container from the tap and leaving it open to the air overnight, any of the purifying chemicals, such as chlorine seems to dissipate. Now I'm not a scientist and this may not be the case but it appears to do so and I use nothing but tap water on my shadehouse plants with no harmful effects.

I have attended many shows in most of the states and I may sound a little parochial but I feel that we in Adelaide present the orchids on the showbench in much better condition than many other states. I think the reason for this is that we have to try that much harder to produce flowers that we tend to look after them a little more. Leaves are cleaned and trimmed, old flower racemes removed along with dead and shrivelled back bulbs.

By far the largest number of dendrobiums exhibited in S.A. are species and hybrids from the section *Dendrocoryne.* The majority grow very well in the shadehouse throughout the year, just bringing them under cover in the winter months to prevent them getting marked, when racemes are developing.

Quite a number of growers have glasshouses with some heat. These are required if some of the more tropical species are grown. They can be housed in the shadehouse during the summer months then brought into the protection of a glasshouse for the winter. Failing to do this will not kill the orchid but flower bud drop is guaranteed while the plant sits and sulks until late spring when it again produces new growths.

After the dendrobiums the next most popular genus would be *Sarcochilus*. *S. hartmannii* grows very well here in the shadehouse. Many specimen size plants are held in collections, it is by far the easiest of the species to flower. *S. fitzgeraldii, S. falcatus* and the rest are a little more difficult, however, when any or at least most of the species are used as parents the progency do very well.

S. ceciliae does require a little more care but many growers cultivate it successfully.

Of the three *Cymbidium* species, *C. canaliculatum* is seen the most. It thrives and flowers quite satisfactorily if kept dry during the winter months. *C. suave* will also flower consistently if given the right conditions but *C. madidum* is rarely seen on the benches and when it is they are rather poor specimens.

So as you can see we do grow epiphytes in S.A., in addition to terrestrials and growers right across the state are busy cultivating their plants ready for the Third Native Orchid Conference to be held in Adelaide in September, 1996. Why not register and see what we produce.

Further details can be obtained by writing to the Hon. Secretary, N.O.S.S.A., P.O. Box 565, Unley, S.A. 5061. ✻

BEECHWORTH SURPRISES!

Jean Deane

A group of friends recently journeyed to Victoria to spend a leisurely few days partaking of the good things of life. Good company and conversation, good food and wine and of course, beautiful scenery and orchids!

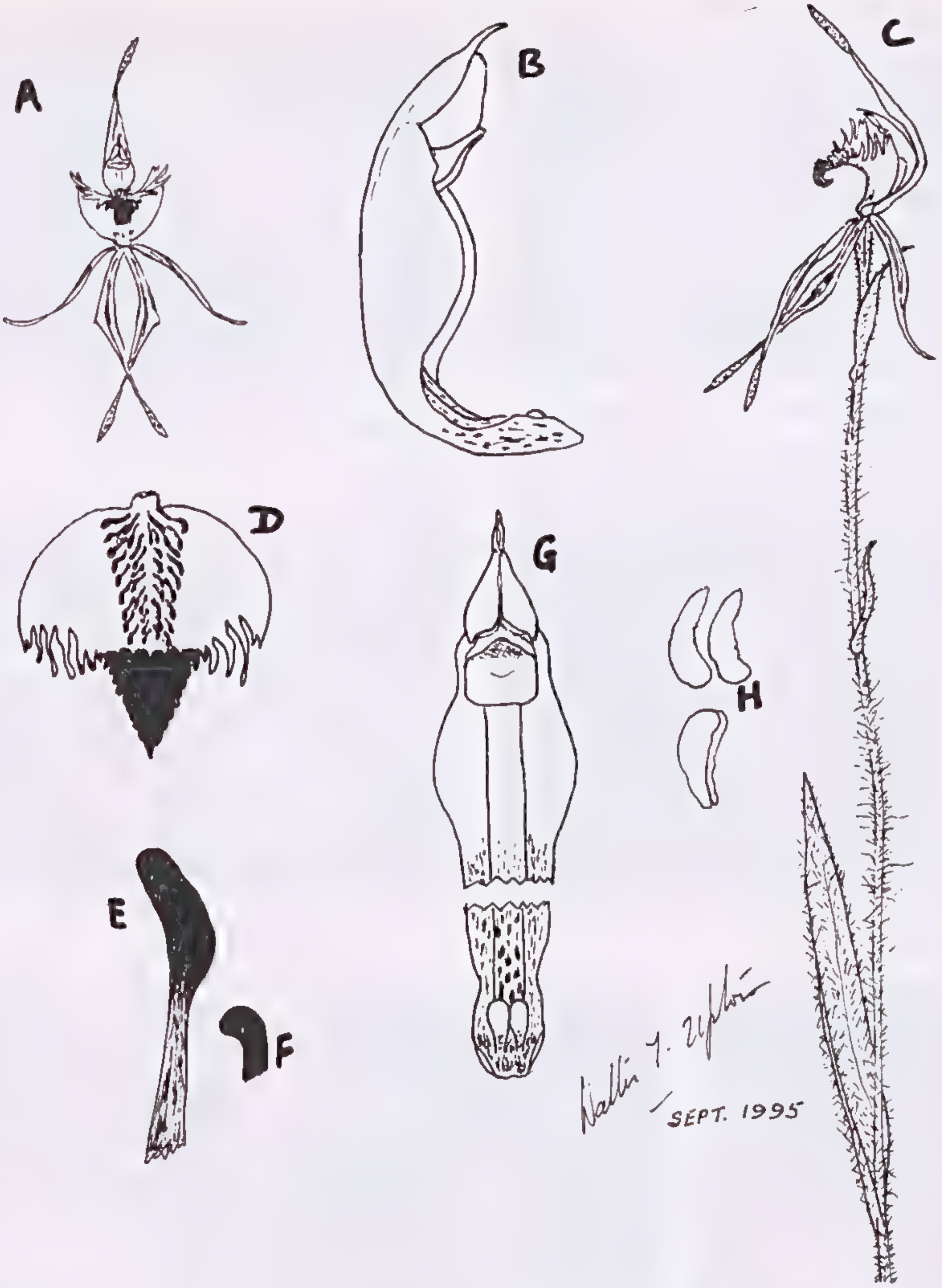
The Beechworth area is a lovely part of the country, especially after the abundant rains of recent times. It is an old gold mining town set amongst granite hills and there are many beautiful old buildings from last centry built of the local honey-coloured granite. There are a number of other picturesque old towns (villages) in the surrounding area as well; there are plenty of things to see and do. Numerous old trees, naturalised bulbs and iris and a general feeling of peace and well being.

What I had not expected to find were orchids. But, sure enough, there they were (terrestrial types) in quite large numbers amongst the granite in the open forest areas. Considering the amount of digging which was done in the old days and the clearing of most of the trees for firewood and construction, it is surprising there were so many orchids more or less readily visible.

The first one noticed was the demure *Pterostylis nutans* with its bowed head. Nearby was a *Corybas* species with a round flat leaf which hugged the ground. We found one in flower, it was *C. incurvus*. There was another plant with a slender hairy leaf which looked like a *Caladenia* species and so it proved to be. The flower was a small version of the much larger *C. dilatata* complex, which I have seen in the Warrumbungles — *C. parva.* the green sepals with a narrow, deep red stripe down the middle and the deep red, knobbly, pointed front on the labellum made a good looking flower. Wal Upton has illustrated it (Fig. 3).

Another day whilst walking we saw more *Corybas* and caladenias as well as a *Cyrtostylis* (probably *C. reniformis*) with a heart-shaped leaf at ground level. Other finds included a *Pterostylis* of the "rufa group", a *Lyperanthus* species and what was probably a *Chiloglottis* but, they were not flowering at that time. What a pity I can't go back this month to see just what they really were!

So, the Beechworth — Rutherglen area is well worth visiting. There are many different types of "surprises" to be found! ✻



Walter T. Upton
SEPT. 1995

Fig. 3 – ***Caladenia parva*** G. W. Carr

From Beechworth, Victoria

A. Flower, front view	1X	E. Labellum callus, basal	8X
B. Column, side view	4X	F. Labellum callus, lamina	8X
C. Plant	1X	G. Column, front view	4X
D. Labellum, pressed flat	2X	H. Pollinarium	4X

AUSTRALIAN NATIVE ORCHID SOCIETY — AWARDS

AWARD OF MERIT

Phalaenopsis amabilis 'Moonshine', AM/ANOS 81.1 points. Mike Harrison. 18th November, 1990 (Plate 9).

Dendrobium Brinawa Charm 'Lucky's Toy' AM/ANOS 82.1 points. Neil and Meg Finch. 15th October, 1992 (Plate 13).

Dendrobium bigibbum 'Top Hat', AM/ANOS 81 points. Henk van den Berg. 21st May, 1995 (No photo available).

HIGHLY COMMENDED CERTIFICATE

Sarcochilus hartmannii 'Red Snow', HCC/ANOS 76.8 points. Ken Russell. 22nd October, 1989 (Plate 10).

Sarcochilus hartmannii 'Noelene', HCC/ANOS 76.1 points. Ken Russell. 22nd October, 1989 (Plate 11).

Dendrobium David Baver 'Monroe', HCC/ANOS. Laurie Jarvis. 29th April, 1990 (No photo available).

Caladenia patersonii 'Conference', HCC/ANOS Les and Kay Nesbitt. 27th September, 1990 (Plate 14).

Sarcochilus Jewell 'Dungog', HCC-AD/ANOS 78.5 points. Sid Batchelor. 21st October, 1990 (Plate 15).

Dendrobium kingianum 'Speckles', HCC-AD/ANOS. Neil and Meg Finch. 20th September, 1991 (Plate 12).

Dendrobium schneiderae var. *major* 'The Major', HCC-ACC/ANOS. 78 points. Gerry Walsh. 5th April, 1992 (Plate 16).

Dendrobium striolatum 'Ruffles', HCC/ANOS 75.9 points. Neil and Meg Finch. 18th September, 1992 (Plate 20).

Cymbidium canaliculatum 'Melba', HCC-ACC/ANOS 79.8 points. Eric Webeck. 20th November, 1992 (Plate 21).

Dendrobium Xsuperbiens 'S.B.', HCC/ANOS 79.4 points. Sid Batchelor. 6th May, 1993 (Plate 17).

Dendrobium Star of Riverdene 'Amanda', HCC/ANOS 79.2 points. Ron Findlater. 16th September, 1993 (Plate 19).

Dendrobium Xleeanum 'Barnham', HCC/ANOS 78.83 points. Michael Harrison. 27th May, 1994 (Plate 18).

Sarcochilus hartmannii 'Highlight', HCC/ANOS 78.75 points. Rod and Sue Nelson. 23rd October, 1994 (Plate 22).

Dendrobium Emma 'Suzy', HCC/ANOS 79.4 points. Henk van den Berg. 2nd September, 1995 (Plate 42).

Dendrobium Yondi Brolga 'Yondi', HCC/ANOS 77.1 points. Henk van den Berg. 2nd September, 1995 (Plate 39).

AWARD OF DISTINCTION

Sarcochilus Jewell 'Dungog', HCC-AD/ANOS. Sid Batchelor. 21st October, 1990 (Plate 15).

Dendrobium kingianum 'Speckles', HCC-AD/ANOS. Neil and Meg Finch. 20th September, 1991 (Plate 12).

Dendrobium kingianum 'Steve', AD/ANOS. Sid Batchelor. 18th September, 1992 (Plate 24).

Dendrobium King Wong 'Striker', AD/ANOS. Norm and Kay Mitchell. 16th September, 1993 (Plate 23).

Dendrobium kingianum 'Boundary King', AD/ANOS. David Butler. 15th October, 1993 (Plate 25).

Dendrobium canaliculatum 'Musgrave Mustard', AD/ANOS. Darryl Smedley. 15th October, 1993 (Plate 26).

Sarcochilus hartmannii 'Yellow Snow', AD/ANOS. Bernie Fletcher. 24th October, 1993 (Plate 27).

Sarcochilus fitzgeraldii 'Toska', AD/ANOS. Ken Russell. 23rd October, 1994 (Plate 28).

AWARD OF CULTURAL COMMENDATION

Pterostylis pulchella 'Goliath', ACC/ANOS. Bernie Fletcher. 12th April, 1987 (Plate 29).

Dendrobium cuthbertsonii 'Apricot Glow', ACC/ANOS. Phil and Yvonne Spence. 5th April, 1992 (Plate 30).

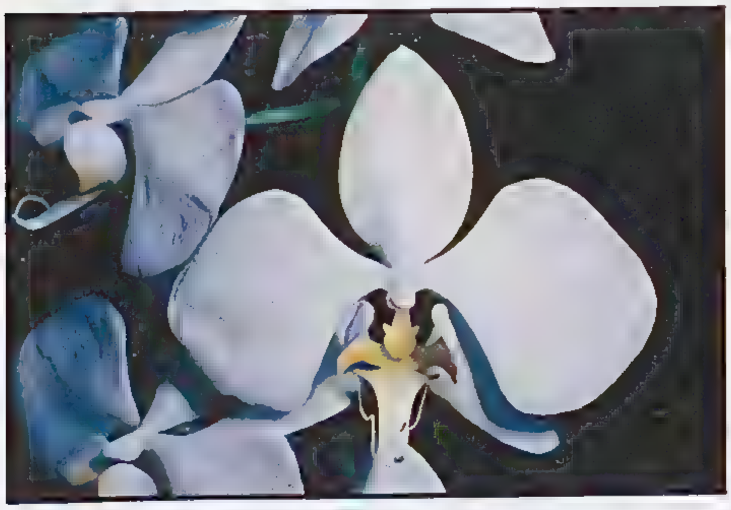


Plate 9: *Phalaenopsis amabilis* 'Moonshine' AM/ANOS. Photo: M. Webb

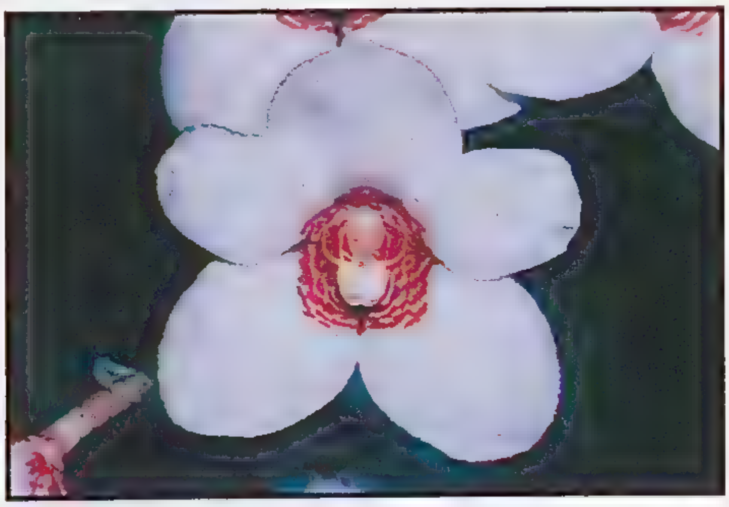


Plate 10: *Sarcochilus hartmannii* 'Red Snow' HCC/ANOS. Photo: M. Webb

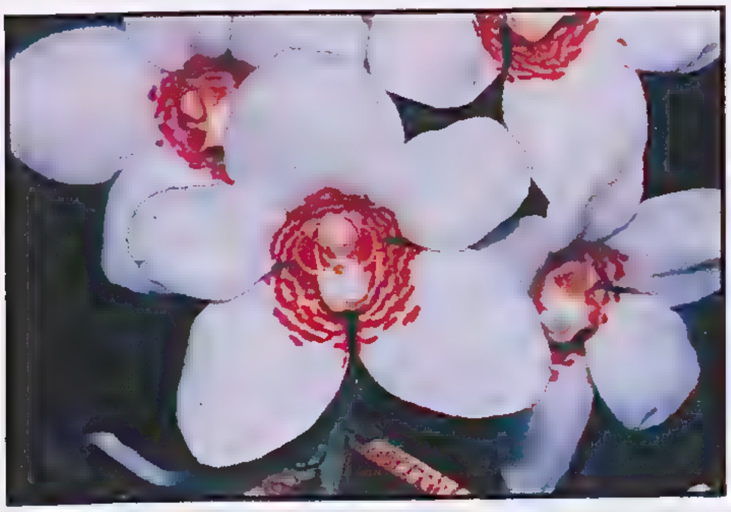


Plate 11: *Sarcochilus hartmannii* 'Noelene' HCC/ANOS. Photo: M. Webb

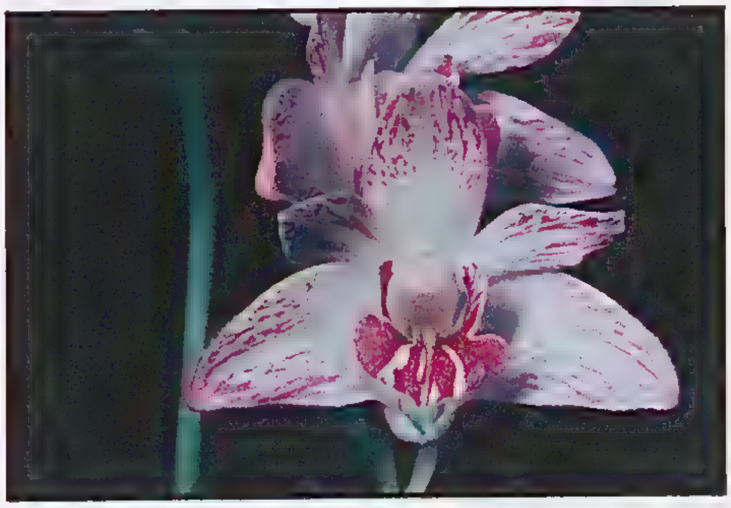


Plate 12: *Dendrobium kingianum* 'Speckles' HCC-AD/ANOS. Photo: D. Banks

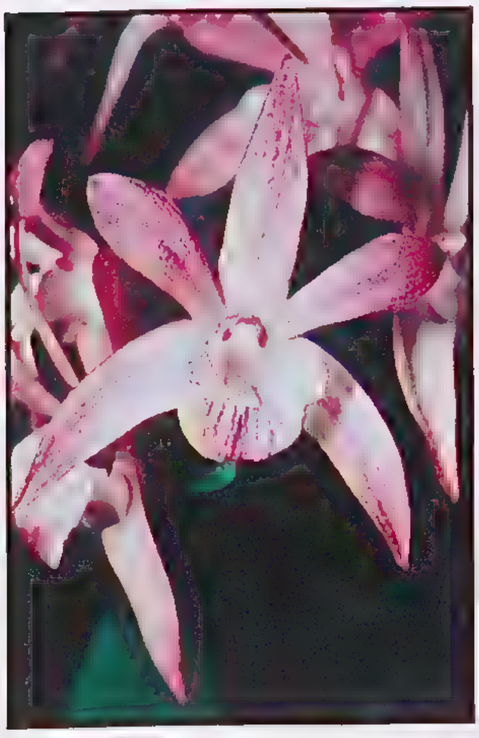


Plate 13: *Dendrobium* Brinawa Charm 'Lucky's Toy' AM/ANOS. Photo: D. Titmuss

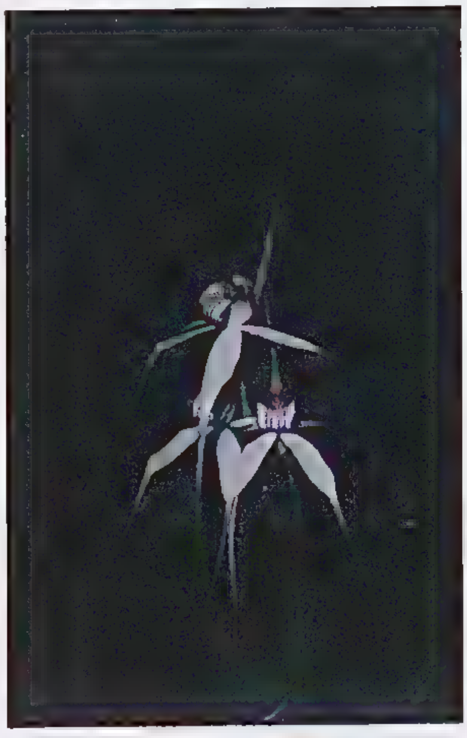


Plate 14: *Caladenia patersonii* 'Conference' HCC/ANOS Photo: D. Titmuss

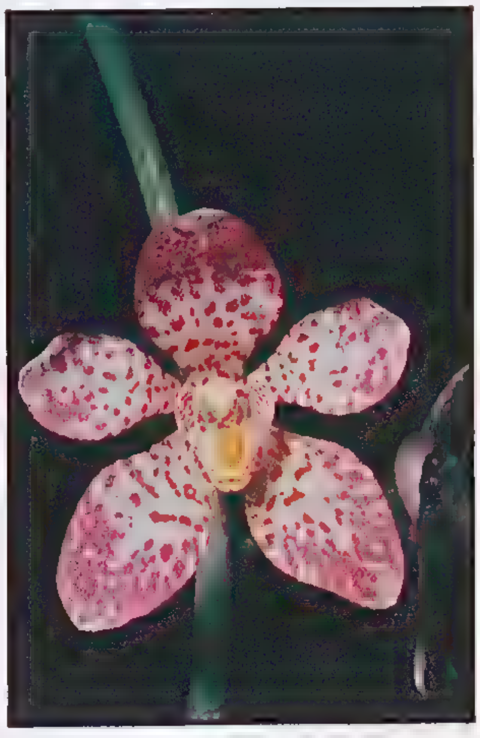


Plate 15: *Sarcochilus* Jewell 'Dungog' HCC-AD/ANOS. Photo: D. Titmuss

Dendrobium schneiderae var. *major* 'The Major', HCC-ACC/ANOS. Gerry Walsh. 5th April, 1992 (Plate 16).

Sarcochilus falcatus 'Cheryl', ACC/ANOS 82.3 points. John Andrews. 25th October, 1992 (Plate 31).

Cymbidium canaliculatum 'Melba', HCC-ACC/ANOS. 83.8 points. Eric Webeck. 20th November, 1992 (Plate 21).

Bulbophyllum exiguum 'Hundreds and Thousands', ACC/ANOS 90.3 points. Neil and Meg Finch. 19th April, 1993 (Plate 35).

Caladenia carnea 'Suzanne', ACC/ANOS 77.25 points. Bill Kennewell. 10th September, 1993 (Plate 32).

Dendrobium kingianum 'Bungan Castle', ACC/ANOS 92.4 points. Eric Webeck. 10th September, 1993 (Plate 33).

Caladenia discoidea 'Robyn's Delight', ACC/ANOS 77.5 points. Stephen Deards. 12th September, 1993 (Plate 36).

Pterostylis concinna 'Glen', ACC/ANOS. E. and J. Smith. 15th July, 1994 (No photo available).

Dendrobium laevifolium 'Cairns', ACC/ANOS 75.8 points. Sid Batchelor. 5th February, 1995 (Plate 37).

Dendrobium bigibbum var. *superbum* 'Bribie Special', ACC/ANOS 80.7 points. Ailsa Heggie, Queensland. 9th April, 1995 (Plate 34). ✻

AUSTRALIAN NATIVE ORCHID HYBRID REGISTRATIONS

(New registrations from lists in *The Orchid Review,* September/October, 1995):–

Name	Parentage	Registered by
Dendrobium		
Alick Dockrill	Maron X *speciosum*	Florafest
Allstar	Star of Dawn X Star of Gold	N. Mitchell (S. Batchelor)
Border Sunset	Gulginni X Star of Gold	S. Penman
Burgundy Cream	Peewee X Dot Sheen	N. Finch
Butter Gold	Susan X Emma	W. Turville (R. & D. Sheen)
Butter Star	Star of Riverdene X X*gracillimum*	W. Turville (R. & D. Sheen)
Candice	Zip X Aussie Quest	Greg Field
Copper Blaze	Aussie Bonanza X Peter	W. Turville (O/U)
Elladae	Ellen X *adae*	N. Mitchell (S. Batchelor)
Gillieston's Royalty	Peewee X Gulginni	Florafest (W. Skillicorn)
Kate Turville	Regal Affair X Zip	N. Finch
Lisa Turville	Regal Affair X Ellen	N. Finch
Sarcochilus		
Kirra-Lea	Heidi X *fitzgeraldii*	Greg Field
Sherlock	Pinky X *hartmannii*	W. J. Harper (Sherlocks Orch.)

TAXONOMIC TREATMENT OF *CALADENIA* IN SOUTH-WESTERN AUSTRALIA — APPRAISAL, 1995

R. L. Heberle
Albany, W.A. 6330

The recent lodgment with the Australian Orchid Foundation Research Committee of S. D. Hopper's and A. P. Brown's manuscript covering south-west Australian terrestrials after some 15 years of research must be a relief to the authors and all who were involved in assisting them over such a protracted period.

This is far from an anticlimax as the authors have provided a rundown of progress throughout the period, that has been widely publicised, by a series of papers and lectures to Orchid, Wildflower and Naturalist Societies. These have been supported by slides representing the proposed new names, reinstatements and changes to existing groups as new genera.

The publication of Noel Hoffman's and Andrew Brown's second edition of Orchids of South-west Australia 1992 contained all these proposals supported by colour plates and text, presumably to be the basis of the manuscript and was presented as a *fait accompli,* where we read on page 9: "Full descriptions of orchids illustrated here for the first time are included in *Australian Orchid Research* Volume 3, published by the Australian Orchid Foundation." When I read this statement I rang the A.O.F. to order a copy of the research and was amazed to find that the manuscript had not been lodged and was not expected for some considerable time. It was eventually lodged approximately two years and eight months later.

During this period the professional sector has been kept up-to-date by a series of papers and lectures at seminars and conferences, by the progressive lodgment at the W.A. Herbarium files of voucher specimens supporting new names and alterations to existing files covering reinstatements and genera changes, with minimum information.

Possibly the most important paper was delivered by S. Hopper at the 12th Australian Orchid Conference, Perth 1991. This extensive paper was entitled "Caladenias: History of Taxonomic Concepts" and covered the sections, Taxonomy as science — *Caladenia* taxonomy — A historical perspective — New techniques — Biological and morphological concepts — Hybrids and what makes a *Caladenia?* — covering nine pages in the conference proceedings. Because of the volume of the paper, I have extracted a few snippets that I found of more than passing interest.

Stephen Hopper states when covering *Taxonomic Science:–*

> "The focus of my talk on systematic concepts is deliberate, I consider that systematics, the classification and naming of living things is one of the most important fields of biological science. It has fallen out of fashion in recent decades, with notions promulgated of venerable old gentlemen poring over even older dusty specimens in mysterious antiquated buildings (herbaria) and finally producing descriptions of new species in an even older language (Latin). Hardly stimulating fare for a high-tech society which places newness on a pedestal (at least the constant bombardment of television advertising would have us believe so).
>
> "In fact, systematics is one of the most rigorously refereed and widely used sciences. It has the excitement of discovery combined with an acute sense of history and of place. To be fully effective, today's systematist has to be an experienced bushman, explorer, historian, geographer, ecologist and field reproductive biologist. He or she also needs skills in computing, molecular biology, chromosome and genetic studies, horticulture, palaeontology, anatomy as well as the traditional fields of comparative morphology and nomenclatural analysis. Increasingly, the taxonomist now plays a major role in conservation biology and practical conservation initiatives. No other branch of botany is so challenging nor exciting in my view.

AUSTRALIAN NATIVE ORCHID SOCIETY — AWARDS

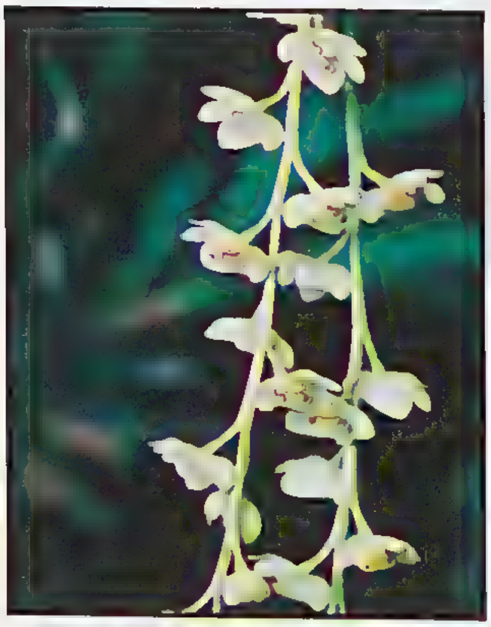


Plate 16: *Dendrobium schneiderae* var. *major* 'The Major' HCC-ACC/ANOS Photo: D. Titmuss

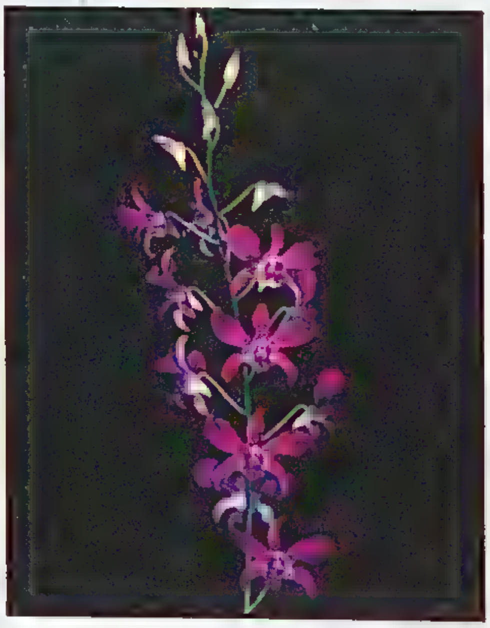


Plate 17: *Dendrobium Xsuperbiens* 'S.B.' HCC/ANOS Photo: D. Banks

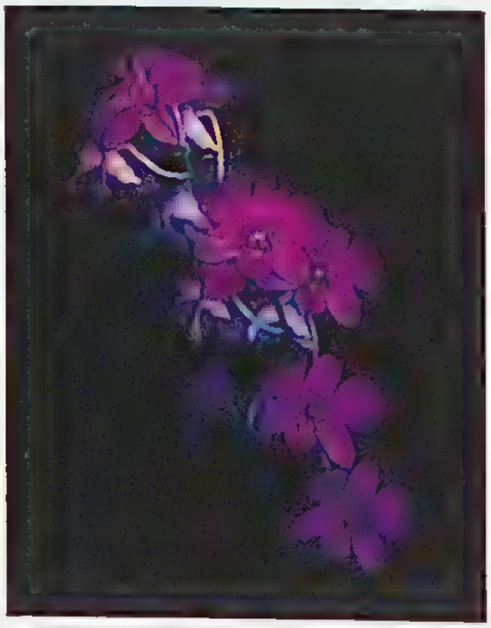


Plate 18: *Dendrobium Xleeanum* 'Barnham' HCC/ANOS Photo: D. Banks

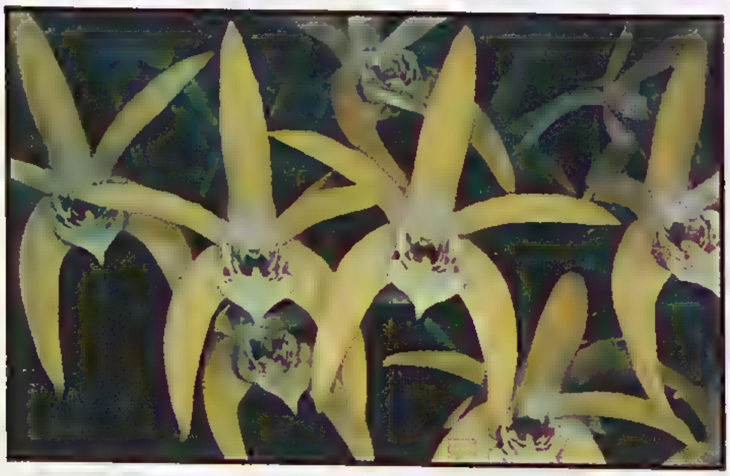


Plate 19: *Dendrobium* Star of Riverdene 'Amanda' HCC/ANOS Photo: D. Banks

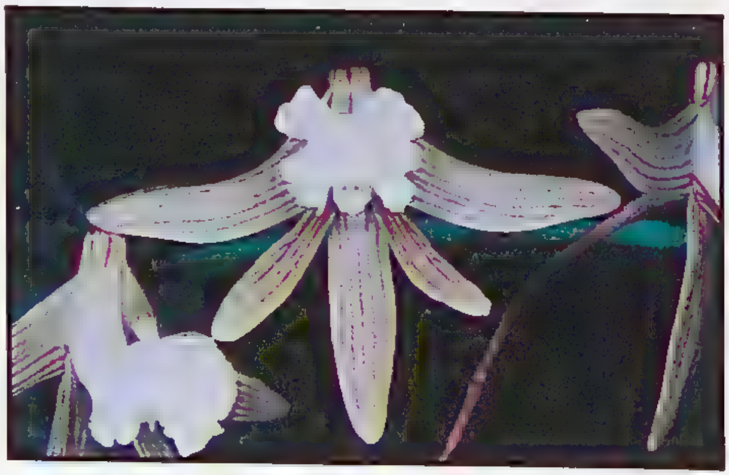


Plate 20: *Dendrobium striolatum* 'Ruffles' HCC/ANOS Photo: D. Banks

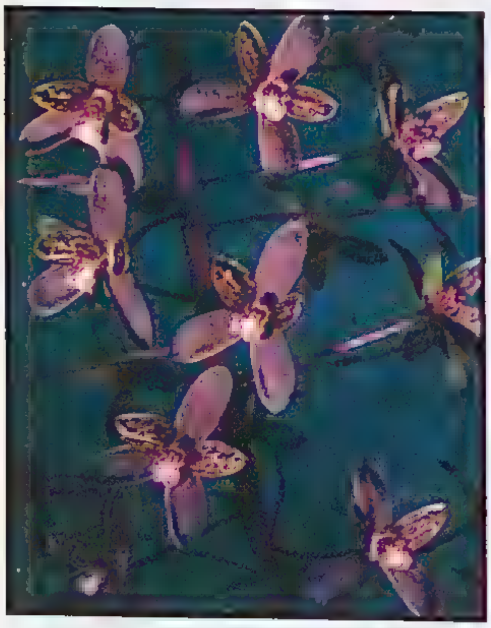


Plate 21: *Cymbidium canaliculatum* 'Melba' HCC-ACC/ANOS Photo: D. Titmuss

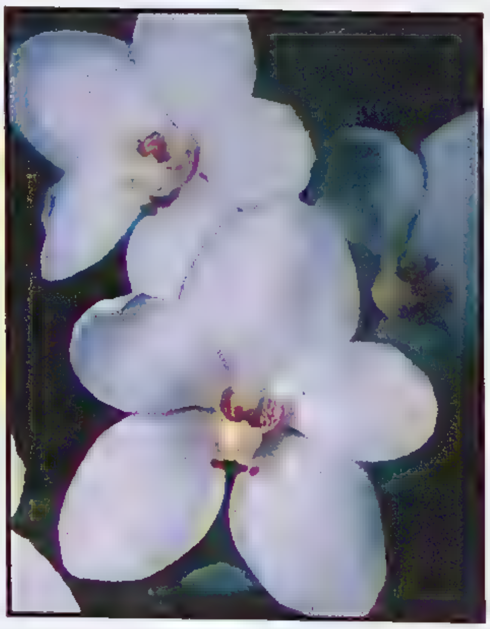


Plate 22: *Sarcochilus hartmannii* 'Highlight' HCC/ANOS Photo: D. Titmuss

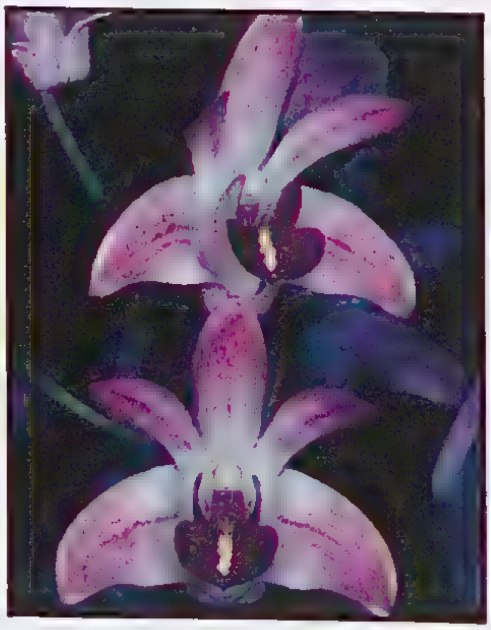


Plate 23: *Dendrobium* King Wong 'Striker' AD/ANOS Photo: D. Banks

AUSTRALIAN NATIVE ORCHID SOCIETY — AWARDS

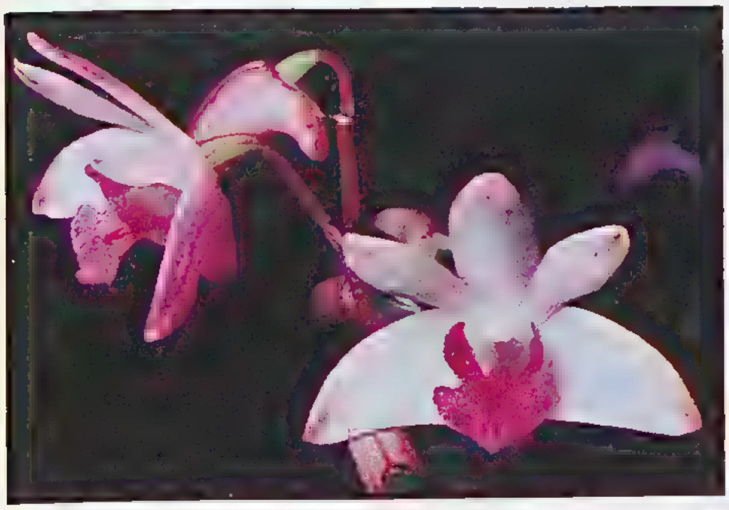


Plate 24: *Dendrobium kingianum* 'Steve' AD/ANOS. Photo: D. Banks

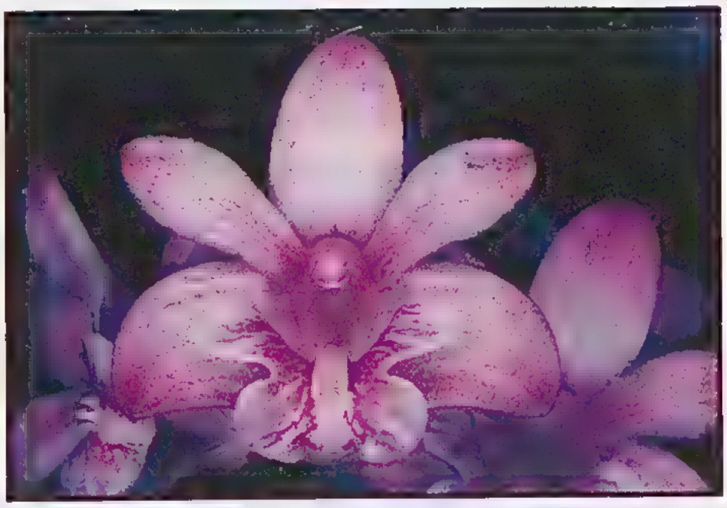


Plate 25: *Dendrobium kingianum* 'Boundary King' AD/ANOS. Photo: D. Banks

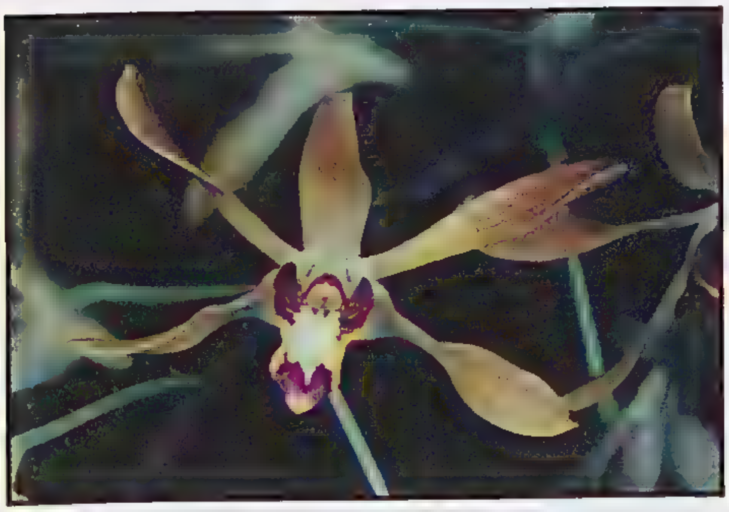


Plate 26: *Dendrobium canaliculatum* 'Musgrave Mustard' AD/ANOS. Photo: D. Titmuss

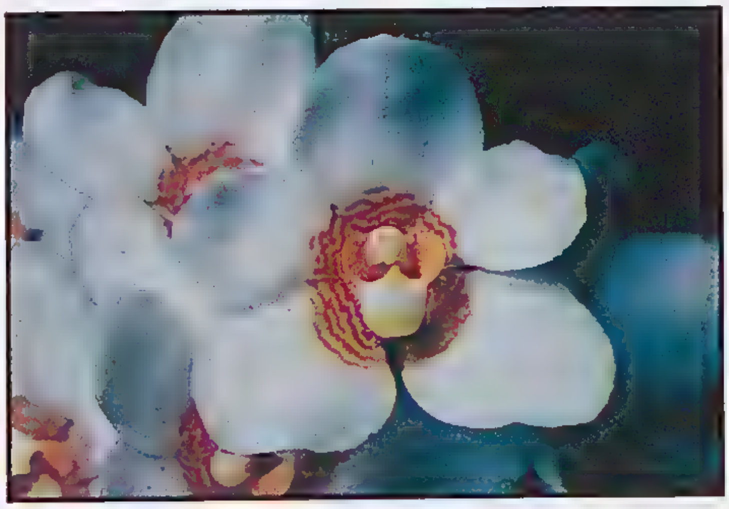


Plate 27: *Sarcochilus hartmannii* 'Yellow Snow' AD/ANOS. Photo: D. Titmuss

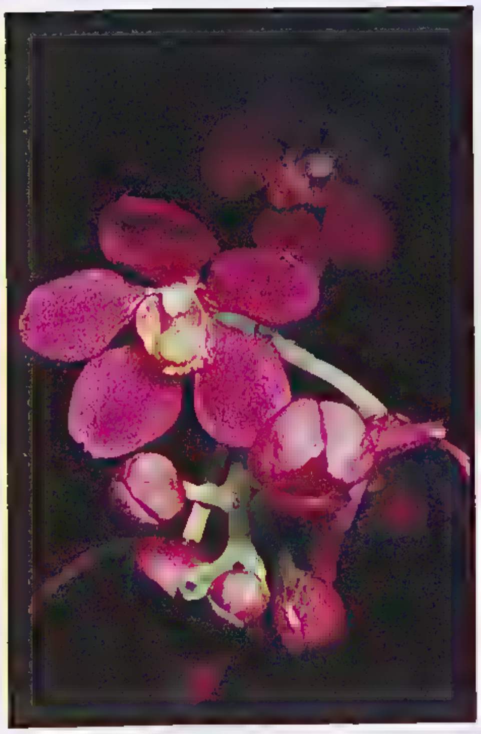


Plate 28: *Sarcochilus fitzgeraldii* 'Toska' AD/ANOS. Photo: D. Titmuss

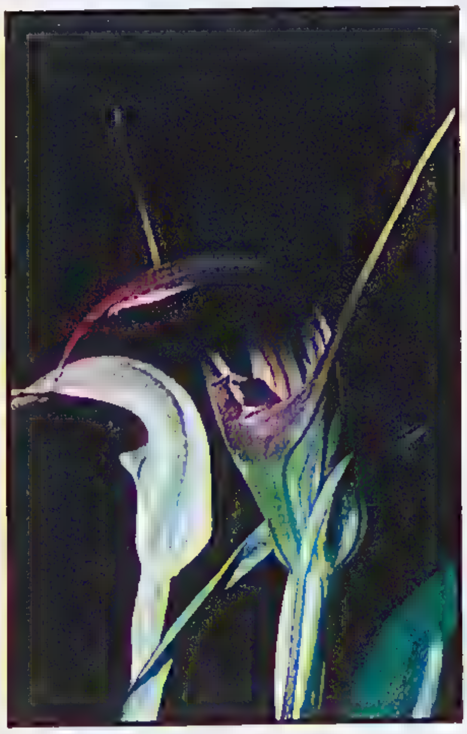


Plate 29: *Pterostylis pulchella* 'Goliath' ACC/ANOS. Photo: D. Titmuss

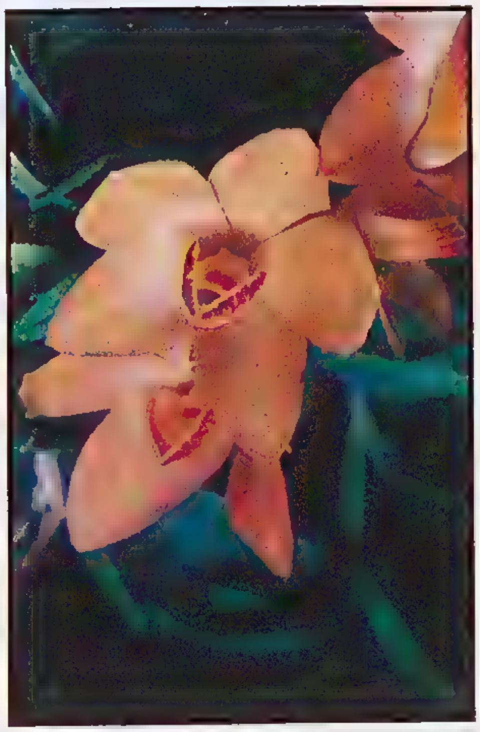


Plate 30: *Dendrobium cuthbertsonii* 'Apricot Glow' ACC/ANOS. Photo: D. Titmuss

"Few taxonomists make it clear that the product they generate, the names of organisms, are rigorously derived hypotheses in the best of scientific tradition. When a species of plant is described for the first time, the taxonomist is saying that the diagnostic characters provided in the description are consistent throughout the identified geographical range of the organism. This is a scientific hypothesis, in that it makes a proposition about the natural world that can be examined and tested by others.

"One of the hallmarks of taxonomy is that such testing occurs far more often than for many other arenas of science. This is because we all need names to communicate and to appreciate the existence of plants. A thing without a name is a thing unrecognised and ignored. Far more people use the names of plants and animals than they do the published results of most biological science. In this sense, then, I contend that the results of systematic research are much more rigorously tested, scrutinised, discussed and disputed than most biological hypotheses.

"This is healthy, ensuring that the taxa ultimately recognised are based on substantial empirical observation and have long-term stability."

CALADENIA TAXONOMY — A HISTORICAL PERSPECTIVE

Under this heading Stephen Hopper lists the inevitable problems between British-based taxonomists Bentham (1873) and Reichenbach (1871) and their broad concepts in relation to specimens submitted by R. D. Fitzgerald and J. Drummond and their justifiable criticisms of determinations that bore little resemblance to living specimens. He gives a series of examples that support this, he goes on to say: "What has happened since is a growing recognition that there is also remarkable variation within species such as *C. patersonii, C. filamentosa, C. dilatata* and *C. huegelii.*

"Taxonomists in the first half of the present century began to tease apart this variation, slowly at first, with the recognition of new species and varieties by Domin (1912), Rogers (1909, 1920, 1923, 1927a, 1927b, 1938), Coleman (1930), Nicholls (1947, 1950) and others. Because much of the work of these authors was done without reference to the type specimens used by their British and European predecessors, some confusion and description of previously named taxa resulted. George (1971) and more recently Clement (1989) and Hopper and Brown (in prep.), have clarified most of the resultant nomenclatural problems."

NEW TECHNIQUES

He lists a series of the new approach — working with living specimens and current advantages that are available to researchers of today compared with those earlier. He gives particular emphasis to preserving flowers and leaves, to sample a population "by dismembering, flattening and separately mounting in rows the petals, sepals, labellums and columns, beneath clear magic tape on a system card;" and lists the advantages that accrue from this.

BIOLOGICAL AND MORPHOLOGICAL CONCEPTS

After introducing the subject he states:–

"While we accept that an element of subjectivity is part of all scientific enquiry, the best works in the field are those that present ideas and data in a way that ensures that they can be examined critically and tested by other workers.

"Perhaps the most important difference between some current Australian systematic philosophy and that of earlier workers is an emphasis on biological as well as morphological attributes in recognising species and subspecies. New species are now recognised by authors such as myself and Andrew Brown, Jones (1991) and Carr (1991) if they grow in populations (i.e. are not aberrant individuals within normal populations), if they have features or a combination of features not seen in any previously named species and especially if they grow with previously named species and produce few or no natural hybrids. Differences in flowering times, in habitats occupied and in pollinators or other attributes used to help identify new species in some cases.

"Geographical races with minor morphological differences are recognised by myself and Andrew Brown as subspecies. These may hybridise and intergrade extensively where their geographical ranges overlap.

"These species and subspecies concepts are thus both morphological and biological springing from the approaches lucidly summarised by Grant (1981).

"It is important to note that a consideration of biological as well as morphological data in deciding on species rank is a fundamental difference to the approach of George (1971) and his predecessors. It leads to the recognition of more species."

HYBRIDS

He states that presumed hybrids: "cause considerable identification problems because, hitherto, they have largely been ignored in published works on Western Australian orchids (other than by Hopper, 1979; Heberle, 1982)."

"For these reasons, hybrids are recognised and will be named formally by myself and Brown if they occur as sporadic individuals among mixed populations of likely parental taxa and where their flowers are clearly intermediate between those of their presumed parents. The presence of an "x" preceding a species' name denotes its presumed hybrid status.

"We have not formally named hybrids where their identification is rendered difficult by the presence of backcrosses in many populations, so that a complete transition in form occurs from one species to the other. In such situations, reference to hybrids is preferred by the conventional formula of the names of the parental taxa linked by an "X".

"We have opted for quite broad hybrid species concepts to avoid an unnecessarily complicated taxonomy and to ensure continued applications of names as previously used."

WHAT MAKES A *CALADENIA*

He gives comparisons between early botanists from Brown (1810), Lindley (1840), Reichenbach (1871), Bentham (1873), Mueller (1882) and George (1971) and the varying differences in their taxonomy. He goes on to say: "On the basis of detailed studies described elsewhere, myself and Andrew Brown consider that a few small groups in *Caladenia* warrant recognition as distinct genera — the blue flowered species (e.g., *C. caerulea, C. deformis, C. gemmata,* to be placed in the genus *Cyanicula,* Hopper and A. P. Brown ined.), the leafless orchid *(C. aphylla,* to become *Praecoxanthus* Hopper and A. P. Brown ined.), the dragon orchid *(C. barbarossa* and its undescribed relatives, to become *Drakonorchis* Hopper and A. P. Brown ined.) and Lindley's *Leptoceras*."

Whilst the detailed studies described elsewhere are not available, I question the proposals to erect a new genus *Cyanicala* to include all the blue caladenias on morphological features *C. amplexons, C. caerulea* and *C. sericea* are closely related. However, *C. deformis, C. gemmata* (including the yellow and white variants) are the reverse. It is interesting to note that *C. saccharata* fits in with the first three, but has apparently been excluded because it is not "blue". This is "sloppy" taxonomy and should be rejected.

Proposals to submerge the *C. barbarossa* complex and erect a new genus *Drakonorchis* to replace *Caladenia* poses the question that this group, hitherto, has been accepted by all previous researchers and revisions. Is this proposed change valid? The only structural difference between *C. barbarossa* and other caladenias are the unique labellum appendages, because a species has been found that has an elastic-hinged labellum reminiscent of the genus *Drakaea,* it is doubtful whether these differences warrant change.

An obvious spin off from the proposals to erect these two genera changes is that, if implemented, will result in the creation of intergeneric hybrids.

AUSTRALIAN NATIVE ORCHID SOCIETY — AWARDS

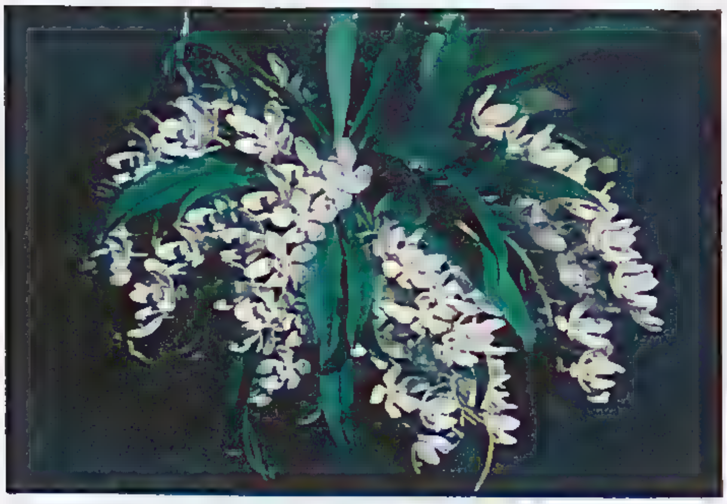


Plate 31: *Sarcochilus falcatus* 'Cheryl' ACC/ANOS. Photo: D. Titmuss

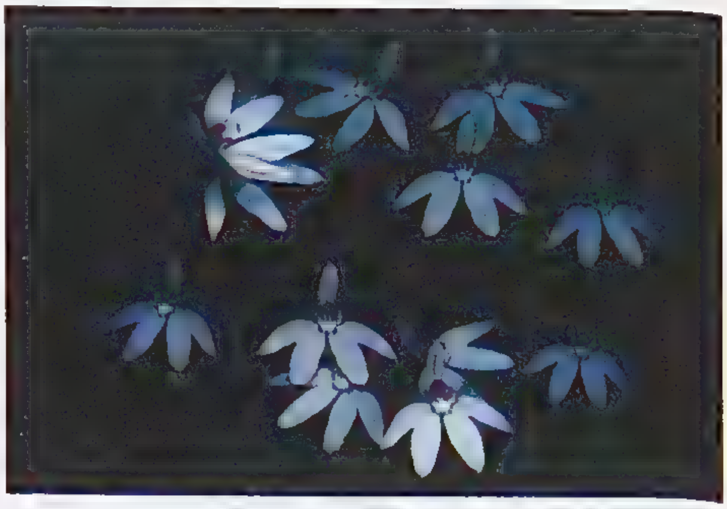


Plate 32: *Caladenia carnea* 'Suzanne' ACC/ANOS. Photo: D. Titmuss

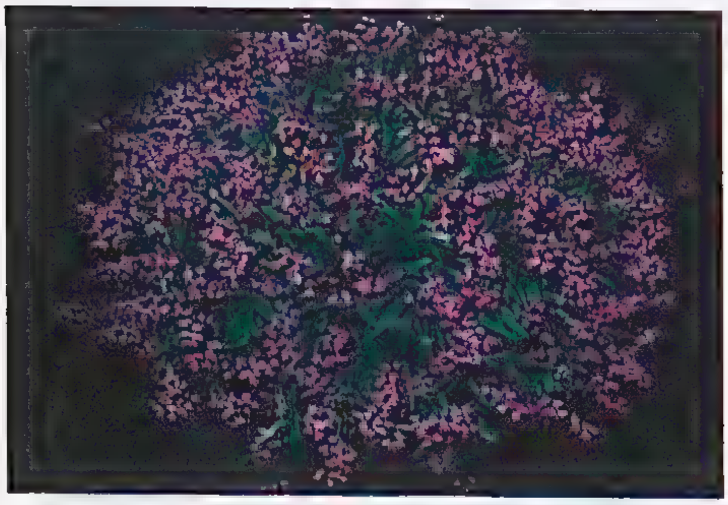


Plate 33: *Dendrobium kingianum* 'Bungan Castle' ACC/ANOS. Photo: D. Titmuss

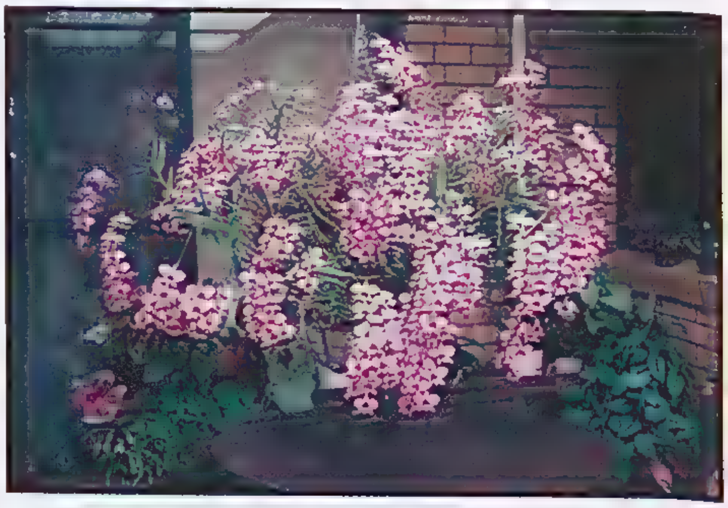


Plate 34: *Dendrobium bigibbum* var. *superbum* 'Bribie Special' ACC/ANOS. Photo: L. Ratcliffe

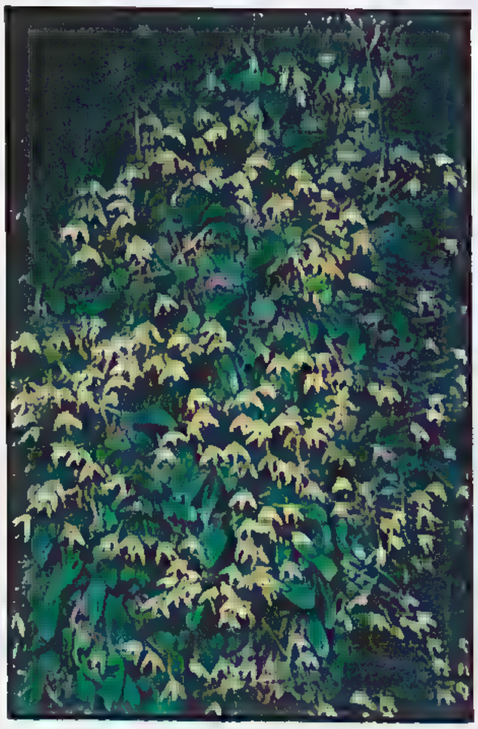


Plate 35: *Bulbophyllum exiguum* 'Hundreds and Thousands' ACC/ANOS. Photo: D. Titmuss

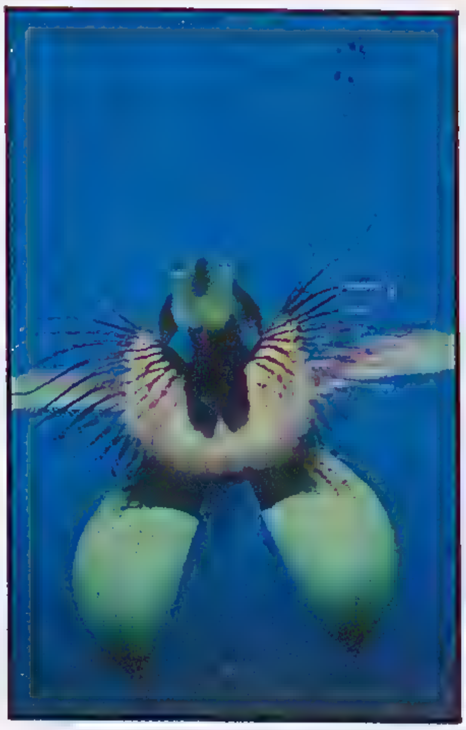


Plate 36: *Caladenia discoidea* 'Robyn's Delight' ACC/ANOS. Photo: D. Wood

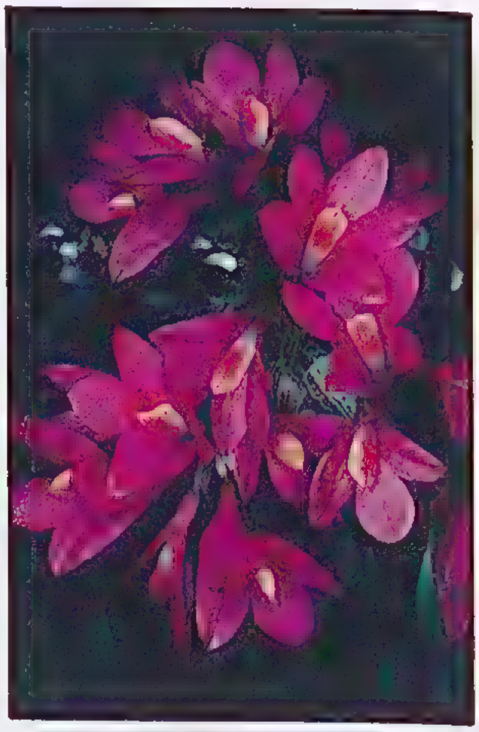


Plate 37: *Dendrobium laevifolium* 'Cairns' ACC/ANOS. Photo: D. Titmuss

Heberle (1982) listed as putative hybrids:– *Caladenia caerulea* X *C. saccharata* — *C. deformis* X *C. saccharata* — *C. barbarossa* X *C. patersonii* — *C. lobata* X *C. barbarossa,* with the passage of 13 years others would doubtless be able to add to the list. From the above it is apparent that all on the list will become intergeneric hybrids, not by nature but by manipulation, hopefully few would accept this as valid or warranted.

The proposal to submerge the two species *Lyperanthus nigricans* and *L. forrestii* under *Burnettia* is a moot point both with many professionals and amateurs, my knowledge of this genus is negligible, I had the opportunity to confer with associates during a visit east in 1993 and found no support for this proposal.

In referring to S. Hopper's introduction covering *Caladenia* he states: "I recognise 131 validly named species. Andrew Brown and I will describe shortly an additional 50 new species and 14 hybrids from Western Australia giving a total of 181 recognised species. I suspect that the genus as circumscribed by myself and Andrew Brown, eventually will have around 200 species, when detailed systematic studies are completed."

Referring to Brown (1993) we find a breakdown of *Caladenia* covering *C. filamentosa* 32, *C. huegelii* 20, *C. longicauda* 25, a total of 77, all with their ranges of distribution, flowering periods and habitat preferences. Brown states: "Other species that will be affected by our revision include *C. longiclavata* which will be split into five species, *C. falcata* and *C. doutchiae* will be split into three and *C. integra* and *C. cairnsiana* into two. Finally *C. flava* will be split into three subspecies and both *C. nana* and *C. reptans* into two subspecies. This will increase the number of *Caladenia* from 55 in 1989 to 126 in 1993, despite nine having been removed.

Whilst this writer does not intend to cover in depth the 99 species of *Caladenia* proposed and will cover only the three major species of *C. filamentosa, C. huegelii* and *C. longicauda,* all of these have distinct and recognisable morphological features but because of a long period of speciation have merged in and out of each other with major hybridisation, particularly with the latter two and now reflect a bewildering array of highly complex forms and variants, especially where species intergrade (refer to Dockrill, 1995). To say that these species have their own preferred habitats, distribution ranges, etc., is patently ridiculous, most orchidologists who have looked at Western Australian caladenias will know this is valid only in isolated instances at the extremities of distribution.

An appraisal of Hoffman and Brown, second edition will confirm that most caladenias are variants described as species and subspecies, the two hundred suggested by Hopper and Brown is conservative, from my personal experience, this could be much greater.

The proposal to submerge *C. filamentosa,* the most widely distributed Western Australia *Caladenia* and one of the most abundant and split these into species and subspecies is doubtful. This species has consistent morphological features such as a dentate labellum margin and two rows of flattened calli angled toward the apex along the central axis. Tepals vary in length and width and colour reflecting all shades of white, pink, yellow, brown and red and often striped and varigated.

The treatment of *C. longicauda* and *C. eminens* and their variants, to split these up similarly as with *C. filamentosa* is also doubtful, these species have four and rarely six rows of golf stick-like calli with the same variation of tepals, there are varying colours of and length of labellum fringes and calli, there are glands at the base of the column. This species is not nearly so widely distributed as the former. The submergence of the *C. pectinata,* the most highly variable of all W.A. caladenias and to replace this with *C. huegelii* that is represented by one distinctly different species is a highly controversial issue, the historical origin and identification of this species is far from cut and dried (Heberle in preparation will cover this elsewhere).

Caladenia pectinata has four rows rarely six golf stick-like calli with a pectinate fringe of varying lengths and a purple to red-brown labellum tip, the widely varying sepals in length and width are all clubbed at the apex and there are glands at the base of the column. Petals are not clubbed. This species shows the widest variation of all W.A. caladenias particularly in colour that ranges from cream, green, brown and red with striping varigation with many. To split out some of these as species and subspecies is hardly acceptable.

Whilst I am bound to accept that approximately one third of the proposals are valid, most have been commonly known over past decades. In so doing, in common with my many associates, I reject the blatant splitting of species that characterise most of the proposals and the ploy of using the subspecies to achieve this (refer to Dockrill, 1995).

I have been referring throughout this article to the proposals that have been presented as fact and are a *fait accompli.* The wide publicity and premature release of manuscript material prior to valid publication under the Convention of the International Code of Nomenclature has given me a unique opportunity to write this appraisal.

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THE POLLINATION OF *CYMBIDIUM MADIDUM* LINDLEY AND *C. SUAVE* R.Br. BY NATIVE BEES — A CASE OF FLORAL REWARD DECEPTION?

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SUMMARY

The pollination system of *Cymbidium madidum* and *C. suave* was examined. Individuals were self fertile, outbreeding and rely upon native bees for pollination. The flowers were fragrant, did not present any pollen or nectar rewards and could attract pollinators by floral reward deception. The pollination system is discussed in relation to ecological processes and life histories.

INTRODUCTION

The genus *Cymbidium* Sw. includes about 44 species, three of which are endemic to Australia (Du Puy and Cribb, 1988). *C. madidum* Lindley and *C. suave* R.Br. are widely distributed throughout eastern Australia and are sympatric between Cooktown, Queensland and Eden, New South Wales.

Cymbidium flowers are presented in racemes and have free perianth segments of similar shape and size. The pollinia are directly attached to a viscidium so that the entire unit is removed by a pollinator. Previous studies have reported native bees as the pollinators of species in Asia (van der Pijl and Dodson,1966; Dressler, 1981; Kjellesson *et. al.*, 1985) and Australia (Macpherson and Rupp, 1934; Smythe, 1970; Adams *et. al.*, 1992; Bartareau, 1993). Adams (1988a) reported that the Australian species were self-fertile, outbreeding and the cost of capsule production may limit the annual capsule set in plants of *C. canaliculatum* R.Br. and *C. suave* (Adams, 1988b).

The aim of this research was to examine the pollination system of *C. madidum* and *C. suave*. Resulting data were then discussed in relation to ecological processes and life histories.

METHODS

Study Site

The study site was near the Walsh River, approximately 8–12km NNW of Herberton (17°23'S, 145°23'E, 900m a.s.l.) in north Queensland. Data were collected from a total of 36 accessible flowering individuals of each species. Using two ascenders in an 11mm static climbing rope, provided full access to plants growing in tree branches, forks and trunks. Individuals were tagged and monitored for three years. Research was conducted between July, 1990 and February, 1994.

Plant Monitoring

Individual plants were monitored throughout the year and during flowering they were visited 2–3 days per week. Inflorescences were inspected and the developmental stages of individual flowers were recorded. The presence of scent was directly noted by placing open flowers into a sealed glass vial and placing them in the sun for one hour. The vial was then opened and assessed for the presence of a scent detectable to the human nose. From anthesis to senescence, columns were inspected for the presence of pollen on the stigma and whether or not pollinia was still intact in the anther. Capsules were scored when dehiscent and shedding seed.

Investigation of the Pollination System

Pollinator activity and behaviour were examined in the field by visual observation of visitors to flowers of the study species. Observations were made between 0900 and 1700 hours under most climatic conditions. Pollinators were observed whenever possible and pollination was confirmed when pollinia were successfully transferred between flowers resulting in capsule production. Pollinators were captured with an aspirator, pinned, photographed and samples sent away for identification.

Experimental Investigation of the Breeding System

All the open flowers of five plants of both *C. madidum* and *C. suave* were experimentally cross- and self-pollinated by hand at least five days after anthesis. Individuals were covered with an insect mesh exclusion bag.

Cost of Capsule Production

Comparisons were made between experimentally and naturally pollinated plants with respect to capsule production and the frequency of flowering in the following year. If the cost of capsule production limits capsule set (Adams, 1988b), then supplemental hand-pollinations would fail to initiate or would abort and/or increased capsule production might decrease flowering the following year.

RESULTS

Pollination System

The flowering period of *C. madidum* was from August to February, and *C. suave* flowered from August to January. The flowers did not offer any obvious nectar but produced a strong sweet scent. The fragrance intensified during the day but dissipated at dusk. Flowers opened successively from the base of an inflorescence and remained open for up to 12 days if unpollinated.

Flowers of the study species were visited by butterflies, European honey bees, native bees, wasps and a hoverfly. These insects vary considerably in foraging behaviour and social structures. Only the social native bees *Trigona carbonaria* Sm. and *T. hockingsi* Cock. removed pollinia and pollinated flowers. All pollinators were female workers.

Pollinators were recorded visiting flowers from 1000 to 1600 hours when the temperature was above 20°C, but activity was greatest during the combined conditions of sunny days and temperatures ranging from 24°C and 34°C.

Trigona bees approached an inflorescence in flight, hovered and then usually landed on an open flower. Individual bees usually visited 2–3 open flowers on an inflorescence. The bees spent about 5–10 minutes chewing and scratching on the ridge of the labellum, below the anther and stigma of flowers. The labellum is curved and moved up and down with the activity of the insect as it continued to enter the flower, with the head of the bee coming close to the foot of the column. After completely entering the tunnel-like floral tube formed by the column and side lobes of the labellum the bee appeared to struggle for about five minutes to exit the flower. A bee after numerous trials then slid to the side of the labellum, arched its body, reverses and wiggles. The bee used its back legs to hook the edges of the labellum side lobes and this grasp appeared to enable it to free itself. As the bee reversed out of a flower the edge of its scutum came into close contact

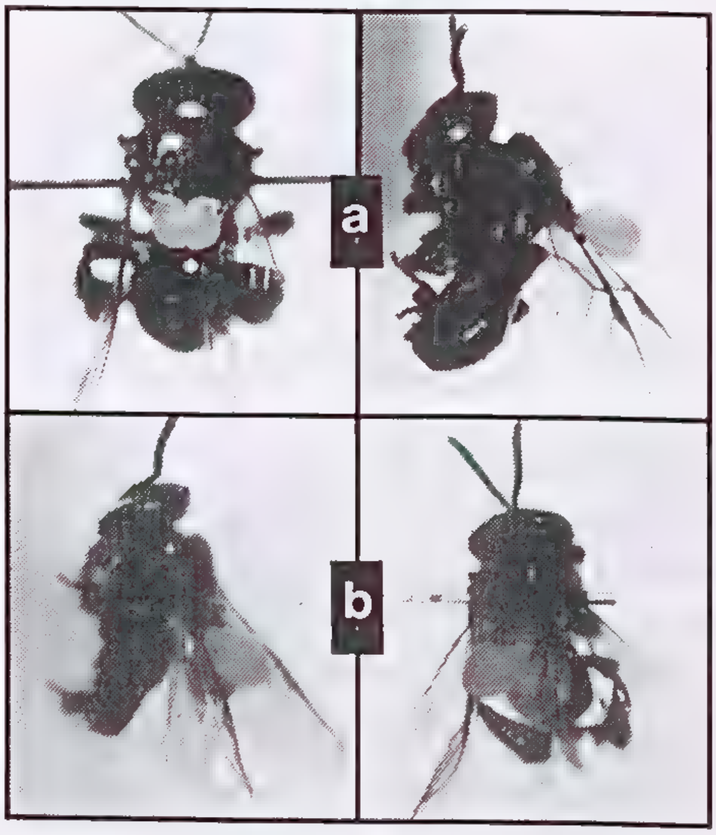


Fig. 41: *Trigona carbonaria* with *Cymbidium* pollinia attached to its scutellum from above and side — (a) *C. madidum;* and (b) *C. suave.*

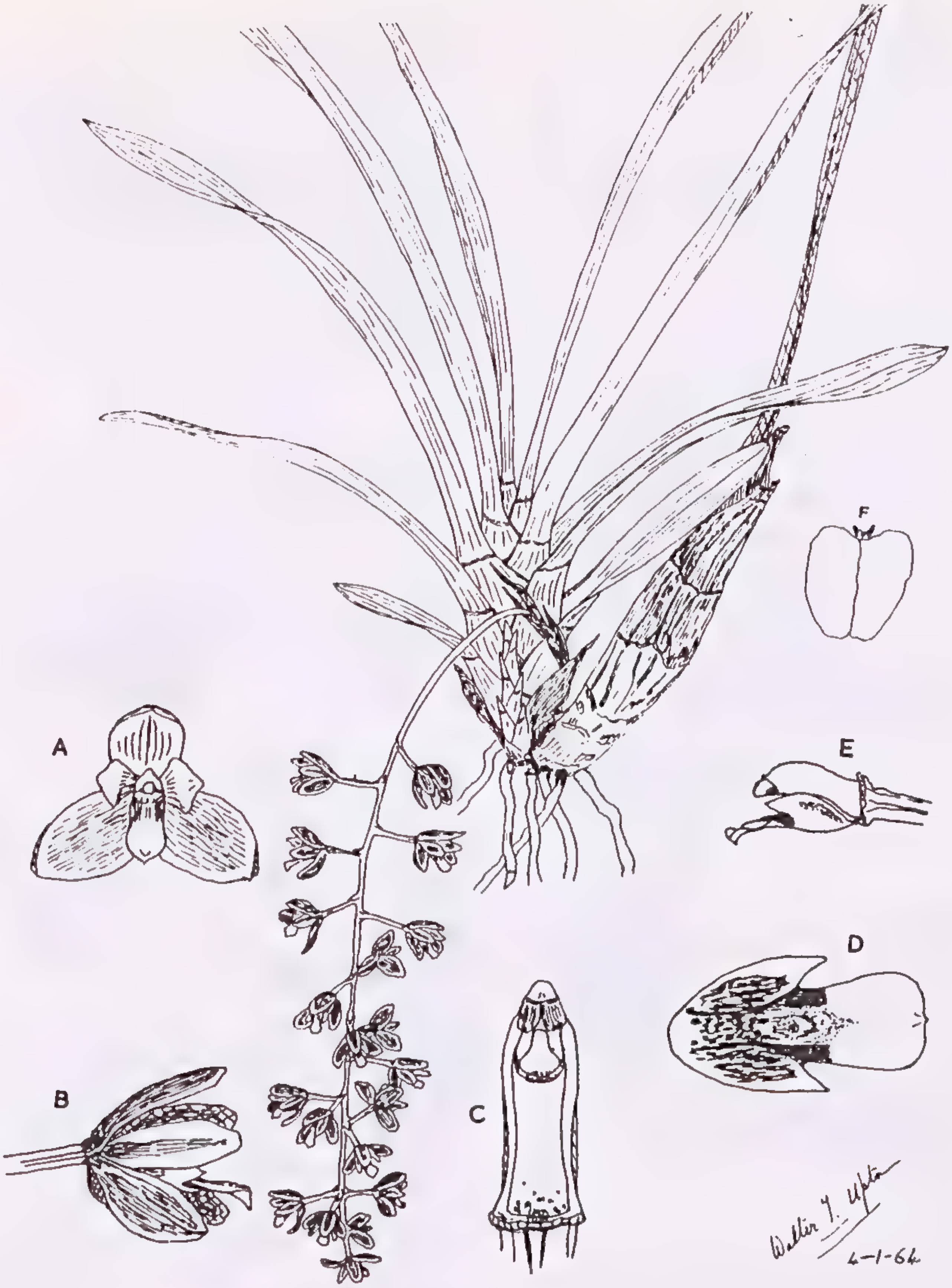


Fig. 5: ***Cymbidium madidum*** Lindley

A. Flower, front view	1X
B. Flower, side view	1X
C. Column, front view	4X
D. Labellum, pressed flat	4X
E. Column and labellum, side view	2X
F. Pollinarium	approx. 15X
G. Plant	¼X

with the column and anther so that the viscidium adhered to its scutellum surface between the wings (Fig. 4). The entire pollinarium was removed by a bee during this process. After a flower was visited, a bee often remained on the apex of the labellum and preened itself for a short period as if collecting a reward.

After visiting a flower a bee with pollinia attached was observed to crawl or fly to another flower on the same plant. The presence of the pollinarium on a bee did not appear to change its behaviour or encumber flight. The bee entered the flower with the pollinarium firmly attached to its scutellum. As it entered the flower it came into close contact with the column and the pollinia were placed on the stigma, completing the pollination process. A new pollinarium became attached to the same bee as it reversed out of a previously unvisited flower. Approximately 59% of 97 bees observed visiting *C. madidum* flowers and 81% of 172 bees visiting those of *C. suave*, had two pollinia attached to their scutellum at the same time.

Breeding System

There were no observable differences between the capsule set from self- and cross-pollination treatment of *C. madidum* and *C. suave* flowers (Table 1). Pollinated flowers senesced after four days and a proportion of the capsules aborted within 10 to 20 days. The remaining capsules developed slowly over a period of 270 and 340 days.

Table 1: Results of experimental hand self- and cross-pollination of all the open flowers of *C. madidum* and *C. suave* plants —

Species (No. of plants)	No. of pollinations – self	cross	% capsule set – self	cross
C. madidum (5)	43	100	67	61^{+}
C. suave (5)	86	100	36	21^{++}

Yates Chi-square: $^{+}$P=0.841; $^{++}$P=0.121

Pollinia Removal and Deposition Rates

The rates of pollinium removal and capsule production were calculated (Table 2). By the end of the flowering period, 5–19% of the flowers produced a capsule while approximately 65–80% of flowers had their pollinia removed. There was an average pollinium removal to capsule ratio of approximately 4–9:1. No natural pollinations were recorded without accompanying pollinarium removal.

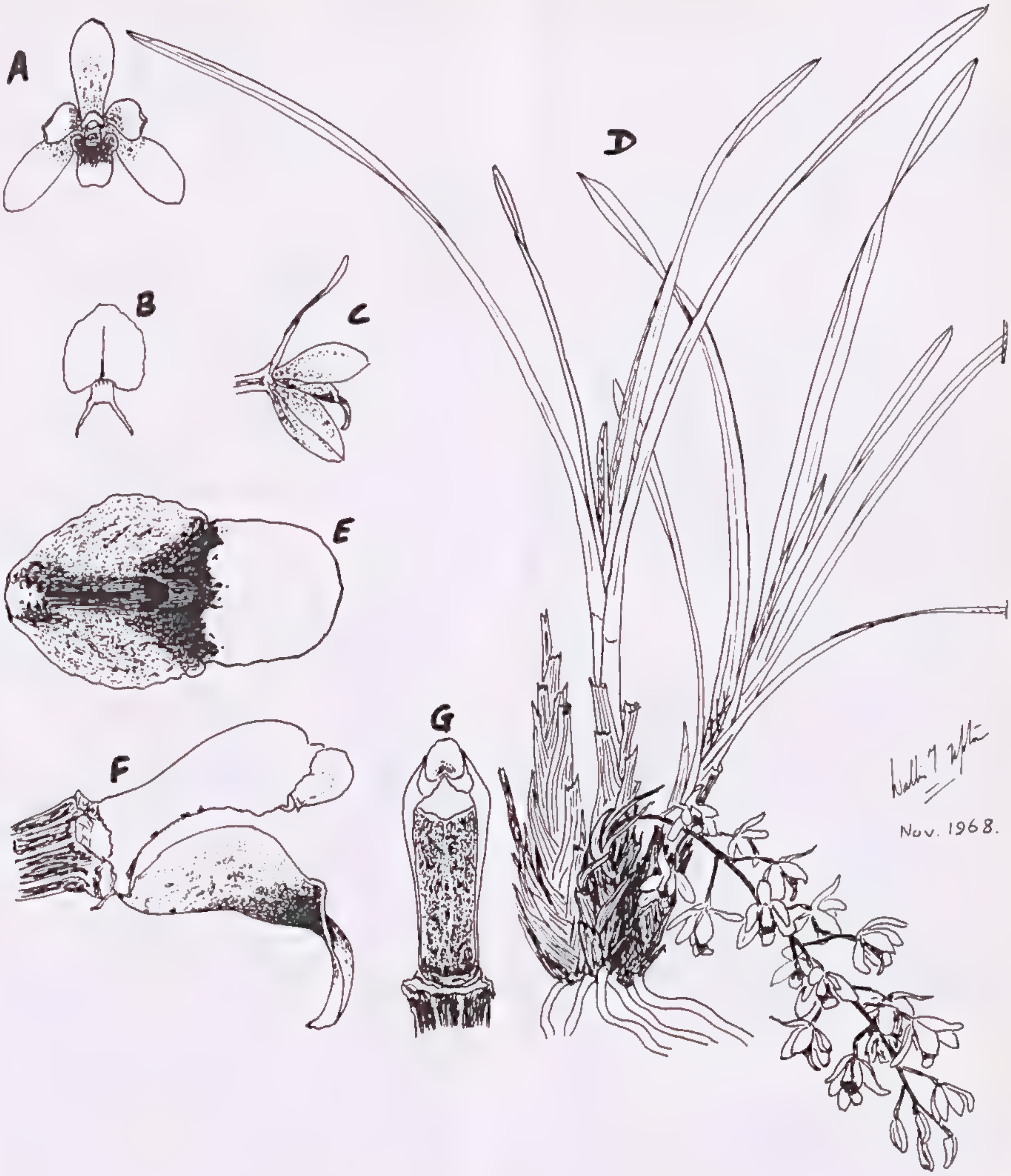
Table 2: Pollinia removal rate and capsule set in *C. madidum* and *C. suave* —

Species (No. of plants)	No. of flowers	% pollinia removed^{+}	% capsule set	Ratio^{++}
C. madidum				
1991 (31)	789	80	19	4.2:1
1992 (29)	743	—	14	—
C. suave				
1991 (31)	1600	65	7	9.2:1
1992 (26)	1367	—	5	—

$^{+}$Pollinarium removal was not scored during 1992.
$^{++}$% pollinia removed:% capsule set.

Pollinia removal from a flower was significantly correlated with inflorescence size (Spearman's r: *C. madidum*, r_s=0.501, n=31, P<0.001; *C. suave*, r_s=0.885, n=31, P<0.001). Capsule production was significantly associated with inflorescence size (Spearman's r: *C. madidum*, r_s=0.405, n=31, P<0.001; *C. suave*, r_s=0.533, n=31, P<0.001) and pollinarium removal (Spearman's r: *C. madidum*, r_s=0.617, n=31, P<0.001; *C. suave*, r_s=0.594, n=31, P<0.001).

Through time, naturally pollinated plants produced flowers more frequently than a capsule (Table 3). Approximately 83–93% of plants produced flowers every year, but only about 6–9% produced a capsule annually.



Nov. 1968.

Fig. 6: *Cymbidium suave* R.Br.

Vales Point, N.S.W.

A. Flower, front view	1X	E. Labellum, flattened	4X
B. Pollinarium	approx. 9X	F. Column and labellum, side view	4X
C. Flower, side view	1X	G. Column, front view	4X
D. Plant	⅓X		

Table 3: Proportion of *C. madidum* and *C. suave* plants (n=31) that produced flowers or a capsule for a given number of years (not necessarily consecutive years) —

Species Status	No. of years 0	1	2	3
C. madidum				
Flowers	—	—	6.5	93.5
Capsule	12.9	6.5	70.9	9.7
C. suave				
Flowers	—	—	16.1	83.9
Capsule	19.4	12.9	61.3	6.5

The experimental supplementation of self and cross pollen to flowers during experiments of the breeding system significantly increased capsule set over controls by 22–50% (Yates Chi-square: *C. madidum*, $x^2_1=56.8$, $P<0.001$; *C. suave*, $x^2_1=60.8$, $P<0.001$).

Cost of Capsule Production

Between 36 and 73% of capsules in hand pollinated flowers aborted prior to maturity. The magnitude of loss was dependent on the species. Individual plants of *C. madidum* had a significantly greater capsule set than those of *C. suave* (Chi-square: $x^2_2=25.2$, $P<0.0001$).

Time of pollination had an obvious effect on subsequent capsule set. Hand pollinations performed early in the flowering period showed a greater probability of capsule production than those later in the season (Table 4).

Table 4: Comparison between % capsule set of experimentally hand pollinated plants of *C. madidum* and *C. suave* during the early, mid and late flowering period —

Time of pollination during the flowering period	No. of pollinations – *C. madidum*	*C. suave*	% capsule set – *C. madidum*	*C. suave*
Early	62	89	100	58
Mid	54	67	52	—
Late	27	30	—	—

All the *C. madidum* plants that did not produce any capsules in 1991 subsequently flowered in 1992 and 93% (n=25) of plants producing at least one capsule in 1991 also flowered in 1992 (Yates Chi-square: P=0.8). Each of six *C. suave* plants that did not produce any capsules during 1991 flowered in 1992 and 80% (n=20) of plants producing capsules in 1991 also flowered in 1992 (Yates Chi-square: P=0.56). Approximately 80% (n=4) and 60% (n=3) of *C. madidum* and *C. suave* hand pollinated experimentals, respectively, subsequently flowered in 1992. The frequency of individuals flowering in the following year was independent of pollination treatment and species (Fisher's Exact Test: P>0.5).

DISCUSSION

The inflorescences of *C. madidum* and *C. suave* produce a long lasting display throughout their flowering periods and the pollinium can be removed easily as a compact unit. Individuals were self-compatible, outbreeding and rely upon female worker caste *Trigona carbonaria* and *T. hockingsi* bees for pollination.

In the Neotropics, Euglossine bees may discriminate between sympatric epiphytic orchids on the basis of differences among species in their floral display (Dressler 1968, Ackerman 1983). The observations of a number of those bees carrying the pollinia of more than one orchid species (Dressler 1968, Ackerman 1983, Roubik and Ackerman 1987), however, suggest that such a system is likely to break down in situations where sympatric individuals present similar floral displays which are inadequate to sustain pollinator specificity. Under such conditions, variation in flowering patterns, positions of pollinia deposition on a pollinator, breeding system and/or habitat requirements presumably maintain genetic isolation between closely related species (Dressler 1968, Ackerman 1983).

The flowering periods of *C. madidum* and *C. suave* overlapped, placement of pollinia on a pollinator was constant and Adams (1988a) reported that the species form hybrids from artificial pollination. During this study, however, *C. madidum* was found in humid and shaded conditions in open forests and vine forests. By comparison, *C. suave* was found in drier open forests and woodlands, often in full sunlight. Individuals of these species rarely occurred close together and clearly occupied different habitats in the vegetation mosaic at the study site. Since *Trigona carbonaria* was both abundant and widely distributed throughout these habitats (Bartareau 1994, 1995a), the spatial isolation and general rarity of plants could be an important factor limiting interbreeding.

Like other *Cymbidium* species, the flowers of *C. madidum* and *C. suave* rely on visual and olfactory stimuli to attract pollinators as no pollen or nectar rewards were produced. Unlike *C. insigne* (Kjellesson *et.al.* 1985), these species do not resemble in colour or shape any other flowers within the community studied. Resulting data from this study and previous work (Adams *et.al.* 1992, Bartareau 1993) indicate that not all *Cymbidium* species rely on mimicry for pollination. I conclude that the pollination system of *C. madidum* and *C. suave* is deceptive as these species are not confined to sites where potential model species are found co-flowering. Since the supply of pollen is transferred by a pollinator as it reverses out of one flower and generally deposited on the stigma when visiting another, there can be efficient pollination service from a few flower visits. Perhaps no mechanism for continuous pollinator attraction is needed.

Ackerman (1986) suggests that a deceptive pollination system in an orchid could have evolved to take advantage of occasional mistakes by its pollinators. Occasional bee visitation rates may be guaranteed through variation in flower colour and the number of flowers on an inflorescence (Ackerman 1986, Heinrich 1975). *C. madidum* and *C. suave* are not a major component of the floral community. The greater density of terrestrial herb, shrub and tree species in the community, together with the scattered occurrence of these epiphytic orchids, would reduce the rate that deception could be learnt by the pollinators.

In flowers that were not visited by pollinators the pollinia remained intact and in place until flower senescence and did not produce a capsule. Apomixis and parthenocarpy were therefore absent in this population of *C. madidum* and *C. suave*. The annual flower-to-capsule conversion rate of *C. madidum* and *C. suave* was about 5–19%. The pollinium removal to capsule ratios of about 4–9:1 indicate that not all pollinia removed from flowers resulted in pollination of other flowers. Several studies support the observation that capsule set among epiphytic orchids is pollination limited (see Bartareau 1995b). However, the observation of 59–81% of the bees carrying two pollinarium at the same time suggests that the pollen deposition process is not as certain as pollen pick-up. Under these conditions, producing more flowers than capsules may increase pollinator attraction and reproductive fitness through male function (Janzen 1977). The strong correlation recorded between inflorescence size, pollinia removal and capsule set supports these general conclusions.

Experimentally hand pollinated plants aborted 36–73% of initiated fruit and the time of pollination was a significant determinant of eventual capsule production. Flowers pollinated early in the flowering season had the greatest probability of producing capsules. These results indicate that the cost of capsule production may contribute to early competition for ovaries within plants. Presumably capsule abortion is an adaptive response that provides individuals with some degree of control over the cost of capsule production.

Experimental hand pollination of all open flowers increased the capsule set by approximately 22–50% over naturally pollinated controls. These results indicate that individuals of *C. madidum* and *C. suave* can allocate the resources required to mature a higher than average capsule set. The cost of capsule production, however, implies that a trade-off exists between resource allocation for present and future growth, flowering and fruiting, supporting published hypotheses (see Bartareau 1995b). Under limited resource conditions, natural selection could favour the development of a deceptive pollination system if pollinator service was guaranteed (Ackerman 1986, Bartareau 1995b).

Trigona carbonaria, along with many native fauna, are dependent on nectar and pollen resources for colony growth and survival. Recent studies have found that female workers exhibit characteristics of the group foraging strategy termed "opportunism" (Bartareau 1994, 1995a). Opportunism is a strategy by which many foragers search independently in the field, but when one finds an exceptional floral resource it can rapidly recruit nestmates (Johnson 1983). The foraging success of a colony was governed by the chance encounter with rich floral resources and these were harvested heavily until depleted (Bartareau 1995a). This information about the opportunistic foraging strategy of *T. carbonaria* helps to explain their generalist flower-visiting habit (Bartareau 1995a) and has implications for a better understanding of the ecological processes possibly leading to a deceptive pollination system among the *Cymbidium* species in Australia (Bartareau 1994).

Adams and Lawson (1993) proposed that a fragrance chemical reward system may attract the pollinators to the flowers. However, as the species are resource limited and abort excess capsules, it is unlikely that the development of a pollinator reward system would be adaptive. Bartareau (1994) found that the visits by *Trigona carbonaria* workers at both multiple-choice feeding stations and *Cymbidium canaliculatum* flowers increased during the course of a day, but the visitation rate at flowers stopped short of that received by sugar solution feeders. Workers recruited nestmates to the rewarding feeders but not the deceptive flowers. The bees clearly made exploratory visits to the orchid flowers before locating a preferred type of forage because the number of those seen carrying pollinia while visiting the feeders consistently increased during the course of a day. Overall, it was suggested that *Trigona carbonaria* workers in search of new food resources were attracted to the fragrant *Cymbidium* flowers by floral reward deception, a system that insures at least a few exploratory pollinator visits.

Although capsule set in *C. madidum* and *C. suave* was pollination limited, the cost of increased capsule production implies that a trade-off exists between allocation for pollinator attraction and future growth, flowering and fruiting. If an optimisation of finite resources over a lifetime overrides the short-term benefits of increased capsule production within a year, then resources allocated to increase pollination might be better committed to future growth, flowering and fruiting (Bartareau 1995b). Since exploratory visits by pollinators appears to be guaranteed, natural selection could favour the development of floral reward deception.

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SHOW REPORTS

A.N.O.S. PORT HACKING GROUP SPRING SHOW — Sunday, 10th September, 1995

Nev. Roper

The Port Hacking Group once again staged a very successful spring show at Heathcote Scout Hall on the southern outskirts of Sydney. Despite the changeable (to say the least) seasons and the plethora of other orchid shows competing for plants, our members managed to bench 152 exhibits. Dave Curry who “personed” the sales table was kept busy throughout the day serving the public who were so inspired by the show that they had to take some home.

All the epiphytic classes were well patronised but terrestrials were conspicuous by their absence. The section winners were as follows:–

***Dendrobium speciosum* —**

1st *D. speciosum* var. *speciosum* 'National White'. Owner: Col Brandon.

2nd *D. speciosum* var. *speciosum*. Owner: George Barrett.

These were both superb examples of the Sydney "Rock Lily".

***Dendrobium kingianum* —**

1st *D. kingianum* 'Betty'. Owner: George Barrett.

2nd *D. kingianum*. Owner: Ron Ussher.

Other *Dendrobium* species —

1st *D. antennatum*. Owner: Paul Turvey.

2nd *D. falcorostrum*. Owner: Dave Curry.

***Dendrobium* Hybrid (Pink or Red) —**

1st *D.* Bardo Rose 'Theresa' HCC/NSW. Owner: Col Brandon.

2nd *D.* Joy Wray. Owner: N. Roper.

***Dendrobium* Hybrid (Yellow or Green) —**

1st *D.* Karsun 'Goldie' HCC/AOC-NSW. Owner: N. Roper.

2nd *D.* Yondi Sparkle 'Green Ice'. Owner: N. Roper.

***Dendrobium* Hybrid (other colour) —**

1st *D.* Star of Riverdene. Owner: Dave Curry.

2nd *D.* Lynette Banks. Owner: Col Brandon.

***Dendrobium* Hybrid (*Phalaenanthe* parent) —**

1st *D.* Lustrous. Owner: N. Roper.

2nd *D.* Minispec. Owner: Paul Turvey.

***Dendrobium* Hybrid (*Rhizobium* section) —**

1st *D.* Michael Jupp. Owner: N. Roper.

2nd *D.* Jiggi X *D. pugioniforme*. Owner: Dennis Wood.

Seedling —

1st *D.* Lynette Banks X *D.* Tweed. Owner: Col. Brandon.

2nd *D. bigibbum* X (*D.* Aussie Ice X *D.* Peewee). Owner: Dave Curry.

***Sarcanthinae* Species —**

1st *Sarcochilus falcatus*. Owner: Peter Dowling.

2nd *S. aequalis*. Owner: Kevin Wilson.

***Sarcanthinae* Hybrid —**

1st *Sarcochilus* Pinky X *S.* Heidi. Owner: Col. Brandon.

2nd *S.* First Light. Owner: Col. Brandon.

Other Orchid —

Kevin Wilson's *Cymbidium* Little Black Sambo cleaned up in this section.

The Junior Section was a very competitive affair with Ben Curry winning out with a well cultivated *Dendrobium kingianum* which became the Junior Champion. Daniel and brother Robert Parker also won junior prizes with some well grown plants. Katrina Parker's *Sarcochilus* Melba was a very pretty little flower which, unfortunately, failed to impress the judges.

Grand Champion and Champion Hybrid of the Show was *Dendrobium* Karsun 'Goldie' HCC/AOC-NSW exhibited by Nev. Roper (Plate 38).

Champion Species was Col. Brandon's *D. speciosum* 'National White'.

A.N.O.S. CENTRAL COAST GROUP SPRING SHOW

Gary Sweikert

The 15th annual spring show was held at East Gosford on the 2nd and 3rd of September. Despite the rain on Saturday and disappointing public attendance, the show itself was a success as far as the orchids were concerned. Hank van den Berg brought a car load of plants down from Newcastle, along with some of their other growers and were rewarded with many of his plants winning their respective classes.

Grand Champion was *Dendrobium* Emma 'Suzy' (Plate 42) grown to perfection by Hank, a beautiful orchid with gently curving pendulous racemes with 18 flowers per raceme. The petals and sepals were lime green with a contrasting pink labellum with purple striations. All flowers faced outwards and presented themselves very well. How pleasing it was to see an "old fashioned" hybrid gain top place at a show.

Reserve Champion was *Diuris alba* (Plate 41), grown by Allan Dash. Filling a 5" pot with five plants of uniform height with eight flowers per plant, colours being typical for this species. This plant also gained Champion Terrestrial Orchid Exhibit.

Champion Species Orchid went to Hank with *Dendrobium speciosum* var. *speciosum* 'Windermere'. It had a well presented raceme with typical light yellow flowers of uniform size.

Champion Specimen orchid went to Albie Sherwood with a well grown plant of *D.* Gillieston Glow 'Catherine'. Only five years old, it was literally covered in green-brown flowers with a contrasting lip typical of the 'Black Pam' influence.

Best Species Seedling went to John Simmons with *D. kingianum* 'Freckles' X *D. kingianum* 'Speckles'. This plant was first flowering and this particular cross will be a true sight in a large pot in a few years.

The judges in their wisdom, judged three orchids to be worthy of awards. Hank van den Berg took away two awards with Albie Sherwood gaining the third. Hank's *D.* Emma 'Suzy' gained an HCC/ANOS with 79.4 points. His *D.* Yondi Brolga 'Yondi' (Plate 39) also gained an HCC/ANOS with 77.1 points, the flowers on this plant being an unusual colour mix of salmon-rose, with plenty of texture and very open. Albie's *D.* Gillieston Glow 'Catherine' gained a provisional ACC/ANOS until 'Black Pam' gains proper species title.

Some other highlights of the show were a large pot of *D.* Bardo Rose, first in its class grown by Hank producing a superb display. Hank's *D. kingianum* 'Big Foot' won its class with large flowers with white petals and sepals and a purple labellum, also his *D.* Brinawa Sunset won its class (Plate 40). the "yellow" classes put on their usual grand display, with beautiful specimens amongst the speciosum's, Xgracillimum's and gracilicaule's. these orchids are still hard to beat when it comes to providing a highlight at a show. Overall there were 236 orchids benched with the split between species and hybrids being fairly even. It was also pleasing to see that everyone was in agreement with the judges choice of Grand Champion — a rare moment indeed.

Finally, the show committee would like to thank all those members involved with staging the show and we look forward to going one better next year.

WARRINGAH GROUP SPRING SHOW

Ruth Rudkin

The outstanding feature of the spring show this year was the displays on the stage of the Forestville Memorial Hall. There were six in all, three large and three small, all most attractive showing obvious attention to arrangement, colour and finish. David Butler and Bernie Fletcher won first prize in the large display section with a compact and balanced arrangement of mostly epiphytic orchids of very good quality. The small display section was won by Ray Young and Peter Eygelshoven and consisted of terrestrial orchids only, well arranged and finished, touched off with several red fungi. The orchids were of top quality, particularly the *Diuris corymbosa,* the *Caladenia carnea* and *C. catenata* (Plate 50 rear cover).

Missing this year was the usual mass of *Dendrobium speciosum* exhibits. the early unusually hot weather followed by a cold snap affected them more than most species. Nevertheless the *D. kingianum* exhibits were there brightening up the hall, Eric Weebeck's Champion Specimen taking much of the attention. John Robert's *Cymbidium* Little Black Sambo (Plate 43) in perfect condition, was Grand Champion and will be nominated for an Ira Butler Trophy, while our hardworking Show Marshall, Chris Arnott won Champion Epiphytic Species with *Dendrobium speciosum* var. *speciosum* (Plate 44) (nominated for the Bill Murdoch Trophy) as well as both Champion Epiphytic and Champion Specimen Epiphytic Hybrid with *D.* Rosemary Jupp. The Champion Terrestrial Species was Ray Young's lovely pot full of *Caladenia carnea* in pristine condition and Champion Australasian species was won by Terry Carter with *Dendrobium atroviolaceum.*

Of particular note were some of the first flowering seedlings, Neil Finch and Joan Cook taking first and second both with a *D. kingianum.* In the Hybrids Section Reg Angus was first with *D.* Star of Riverdene and Terry Carter second with *D.* Duke X *D. jonesii* var. *magnificum.* The two outstanding *Sarcochilus* hybrids: *S.* Pinkhart X *Parachilus* Riverdene and *P.* Polka Dot both were benched by Neil Finch. As usual, Erick Lielkajis benched quite a number of beautifully grown species, allowing all to be able to distinguish between *Dendrobium canaliculatum, D. foelschei* and *D. tattonianum.* Also one of his winning group of three epiphytic species must be the tiniest orchid ever, a *Taeniophyllum* sp. with a pseudobulb the size of a pin head with a perfect flower not much bigger.

The show was a success largely because of the way so many members rallied around helping President Mick Korzonowski with the sales table, Chris Arnott as Show Marshall, Terry Carter as Show Secretary, John and Rini Harriott joint secretaries of Warringah, Joan Cook at the door and Bill Westwood with the raffle. A show Warringah Group can be proud of.

QUEENSLAND ORCHIDS SOCIETY SPRING SHOW

Congratulations to the Gregory's and to native orchids. At the Queensland Orchids Society's Spring Show at Mt Coot-tha on the 15-17th September, 1995 the following was the scorecard in the name of B. Gregory:–

Grand Champion Orchid of the Show — *Dendrobium kingianum* 'Caloundra'.

Reserve Champion Orchid — *D.* Bardo Rose 'Chris'.

Champion Specimen — *D. Xsuffusum* 'Doyles River'.

Champion Species — *D. kingianum* 'Caloundra'.

Champion *Dendrobium* Hybrid — *D.* Bardo Rose 'Chris'.

Champion Native Orchid Hybrid — *D.* Bardo Rose 'Chris'.

Champion Australian Native Species — *D. kingianum* 'Caloundra'.

Not bad for Australian natives? Our orchids are second to none. ✾

LETTERS TO THE EDITOR

7 Leslie Court,
Werrington, N.S.W. 2747
11th September, 1995

Dear Sir,

Congratulations for publishing such an interesting article as Doug Binns "*Schistotylus purpuratus* — Uncommon or Just Inconspicuous" Vol. 11 No. 9, September, 1995.

I have maintained a close association with the famous "west of Wauchope" colony since September, 1980 and I revisit the thriving little swamp every few years. The host tree *Leptospermum polygalifolium* is slowly dying off on the southern side of the swamp. This was the area that formerly supported the greatest number of plants of *Schistotylus purpuratus.*

Luckily the leptospermums closest to the road, where very few orchids had colonised 10–15 years ago, are now supporting good numbers. They have obviously matured enough to provide a stable environment for moss and lichen that associate with *S. purpuratus*. So, while the concentration of orchids has shifted, numbers have remained stable.

Doug mentioned seeing many specimens of *Schistotylus* that had been eaten by insects. I have constantly noticed this worrying aspect on numerous occasions. I have never observed the insect at work in daylight and have assumed it must be a nocturnal pest.

On a visit to the colony in June, 1995, my brother and myself clearly observed three distinct instances when a type of native slug was feeding on assorted sized orchids along the small outer twigs of the leptospermums. It was raining fairly heavily at the time of our visit and I was convinced that the dampness allowed and encouraged the slugs to come out in daylight hours.

This species of slug averages about two to three centimetres long and possesses a short, blunt but distinct "tail", similar in shape to the tail of a platypus. The side of its body is edged with maroon outline. Its general shape is nothing like the typical garden slug. It is shorter, broader, higher and it has a skirt of muscle tissue around the actual body. I have some excellent video film of the encourter but no still photos were taken.

Finally, congratulations to Doug for putting in the footwork and locating a couple of new colonies of this truly elusive species. I have searched for new colonies of *S. purpuratus* myself but with no success. Doug's observations will aid me greatly in future explorations.

Gerry Walsh

P.O. Box 127, Atherton, Qld. 4883

The Editor, *The Orchadian,*

I was pleased to read the letter of Rod Britton in *The Orchadian* 11(8):395 (1995) wherein he tells us that he has seen plants of *Bulbophyllum macphersonii* Rupp growing on a mangrove in the Daintree River. It is by people sending in such pieces of information that we gain a greater understanding of our orchids. In this case it also shows us how adaptable some orchids are and that they can occur in a range of habitats.

However, for the information of Mr Britton, in the 1992 edition of *Australian Indigenous Orchids* the occurrence of the species is given as: ". . . generally on the ranges and tablelands above about 450m".

This is yet another example of how it pays not to be too rigid about anything to say about orchids.

Yours sincerely, Alick W. Dockrill

Burleigh Park Orchid Nursery
54 Hammond Way, Kelso, Thuringowa,
Qld. 4815 Australia
Phone/Fax: (077) 74-0008. Inter. 61 77 740 008

Ref. 10961

7th September, 1995

Walter T. Upton
P.O. Box 215
West Gosford, N.S.W. 2250 Australia

Dear Walter,

After some 20-plus years, I have renewed my foundation membership of A.N.O.S. and have just received my first copy of *The Orchadian.*

A big difference to the original *Orchadian* and a much improved publication. My commendations.

I found your "Talking Point" of great interest. It is true that the interest in orchids in general has waned and commercial nurseries have found the going rough.

Back yarders and commercial minded "Orchid Societies" unwittingly do damage the progress of orchids in that they do not support the professional nurserymen who do in the long run, generate the orchids of the future. If there is no professional nurseryman propagating in quantity or pursuing a breeding line, then eventually everyone will only have the often second rate material from the back yarders.

But there is the challenge: the nurseryman MUST develop a speciality line that the back yarders cannot match.

From our perspective, as a specialist in the original species orchids, both Australian and exotic, we work hard at producing flasks and seedlings of rare orchid species that are not available in Australia and certainly not available from the back yarders. Our efforts extend internationally and we work with many international nurserymen to transfer seed, protocorms and seedlings worldwide.

No nursery can grow everything. This is the age of specialisation, growers need to know who is growing what. They need to do their homework and research sources.

Darryl Smedley, in the same September issue, rightly points out that there are now more species orchids available in Australia than ever before. This is particularly true in our field. Five years ago we had 150 different species in flask. Today, we have over 800.

So we must work hard to propagate both the interest in orchids and the orchids to maintain that interest, be it species or hybrids.

Thanking you, yours sincerely,
Ian and Pat Walters

Merrellen Orchids
181 Macdonnell Road,
Eagle Heights, Qld. 4271
12th September, 1995

The Editor, *The Orchadian*

I have just read the review of Peter and Sheryl's book on *Dendrobium kingianum* and must congratulate them on it: the only criticism I have is perhaps the colour reproduction could have been better. However, I must take offence at some of Murray's remarks regarding *D. kingianum* 'Corrigan's Red' in this review.

At one stage he says, the photograph on page 77 is the real thing and next he says that Ted and Barbara don't own the real thing! How can this be when the photograph was taken in our bushhouse?

Murray is being very naive if he thinks a plant of this quality would remain the property of one or two people for very long.

I think he also made the mistake of not fully reading those Merrellen Orchids labels he mentions. If he had done so he would have found the full caption on those labels was ***D. kingianum* 'Corrigan's Red X self.** As Peter mentions in the book one of the problems we have in nomenclature is that people will drop the **X self** when they talk about the plant or rewrite their label at some stage.

I am one of the many who self good clones in pursuit of Mendel's Law, which is as true today as it was when he stated it hundreds of years ago.

At the first national A.N.O.S. Conference at Wollongong some years ago Murray and I talked about 'Corrigan's Red' after my lecture where he admired my slides of it and some of its progeny. He very much admired the seedling we named 'Murray' in his honour. This was the pick of the selfing, that we kept to flowering size. There may be better ones out there as Merrellen sold over 200 of them.

At the time I promised him an aerial of 'Murray', the offer still stands!

Yours faithfully, Ted Gregory

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27 Lindfield Gardens
2 Ulmarra Place
East Lindfield, N.S.W. 2070
21st September, 1995

The Editor, *The Orchadian*

Dear Sir,

SARCOCHILUS BREEDING

I am writing in appreciation of letters from David Banks, David Butler, J. T. Woolf and Lorraine Fagg which so enlivened the September, 1995 issue.

David Banks' cliché "Big is Beautiful but

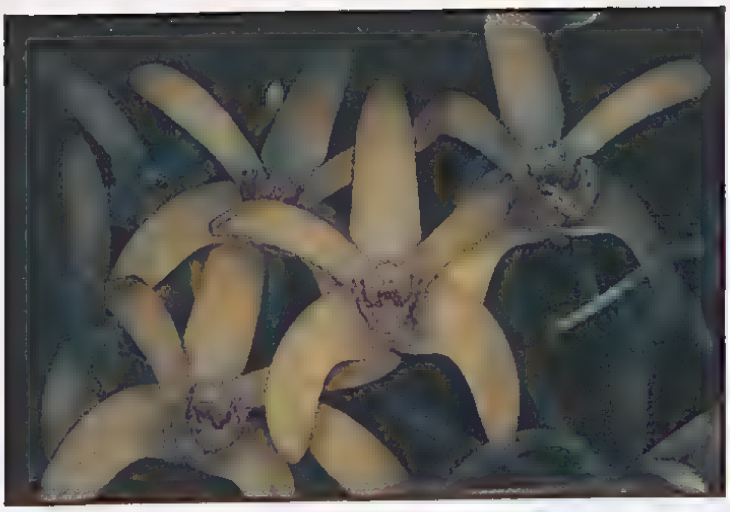

Plate 38: *Dendrobium* Karsun. Photo: R. Napier

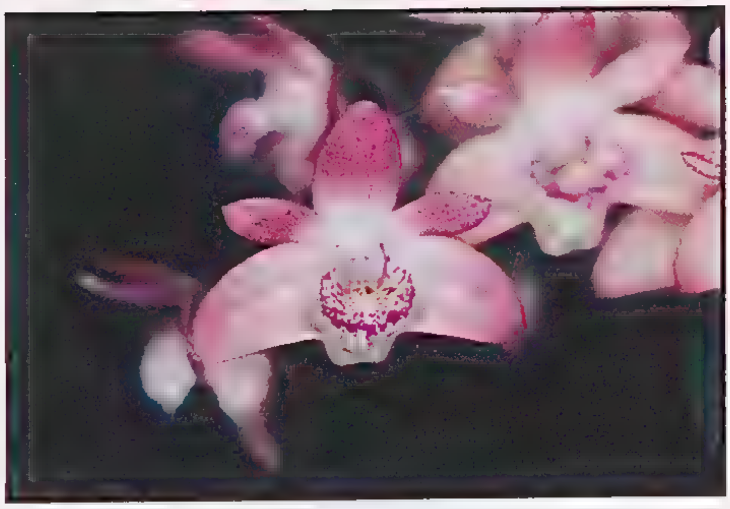

Plate 39: *Dendrobium* Yondi Brolga 'Yondi' HCC/ANOS. Photo: J. Andrews

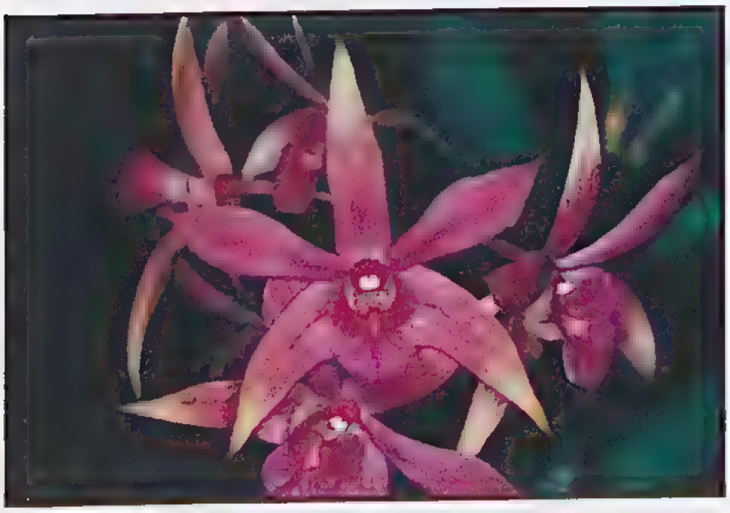

Plate 40: *Dendrobium* Brinawa Sunset. Photo: J. Andrews

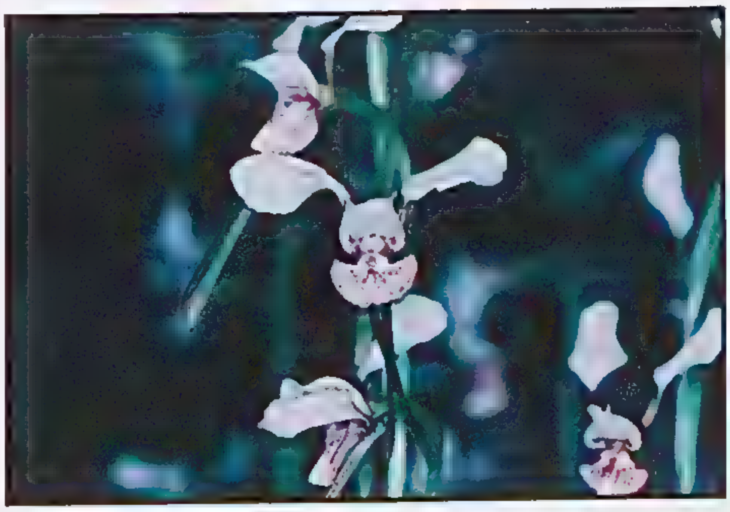

Plate 41: *Diuris alba.* *Photo: J. Andrews*

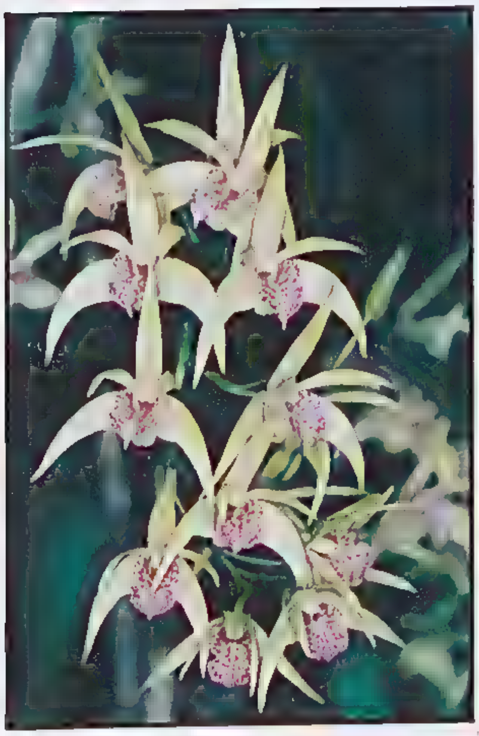

Plate 42: *Dendrobium* Emma 'Suzy' HCC/ANOS. Photo: J. Andrews

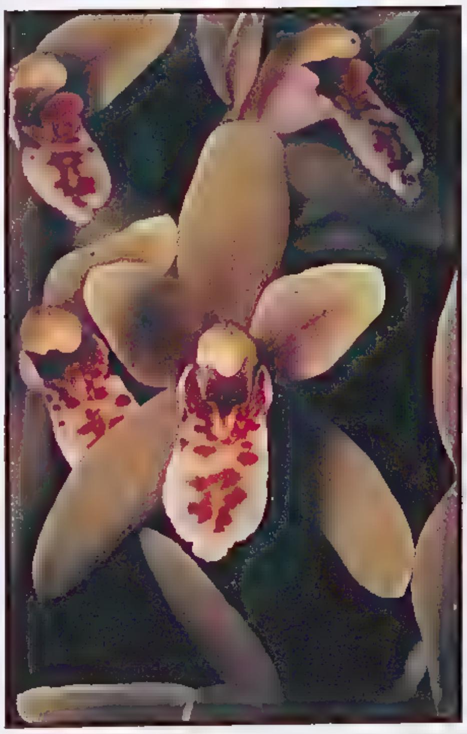

Plate 43: *Cymbidium* Little Black Sambo. Photo: D. Titmuss

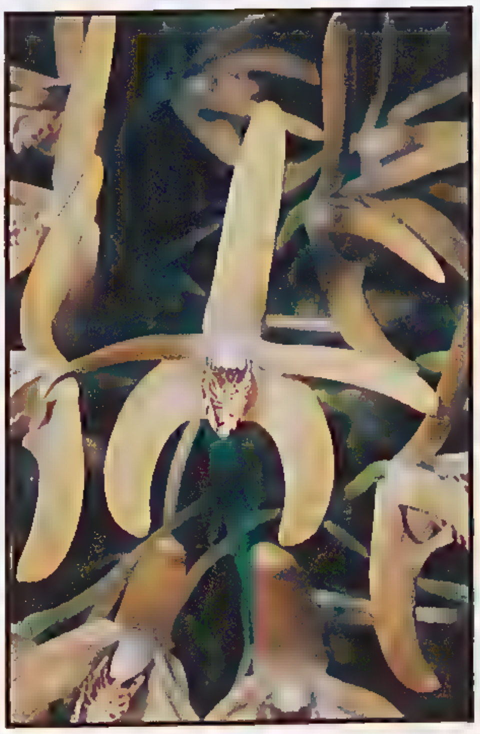

Plate 44: *Dendrobium speciosum.* Photo: D. Titmuss

the Best Things come in Small Packages" both pleased and reminded me of a flowering among my Sarcos last year. This was a first effort by a small seedling from Ken Russell, *S. hartmannii* BK *albus* X *S. hartmannii* 'Tumblegum' *albus.* The plant produced a shower of small pure white crystalline flowers; the effect was dainty and fairy-like so I presented it with the clonal name 'Titania'.

To be even-handed and with apologies to David there is another cliché which says: "Beauty is in the Eye of the Beholder". Well, yes, so maybe it's just as well we don't all see eye to eye, thus making for greater diversity. Despite one's own preferences and mine are obviously "Small is Beautiful", there is room enough for other ideas and breeding research.

A passing thought: How many years do we have before some Genetic Engineer tries out the technique on our lovely *Sarcochilus*?

With kind regards, sincerely Lawrie Deane

15th September, 1995

The Editor, *The Orchadian*
Dear Wal,

Well Bill Morris has done it! He has succeeded in getting people to think and talk about *Sarcochilus* breeding. I can see Wal. Upton rubbing his hands together and saying: "At last! People are talking!" and overall this can only be good for native orchids.

It nevers ceases to amaze me just how many points of view there are. Since Bill's article (regarded fairly widely as criticism) of David Bank's and my articles on *Sarcochilus* breeding. A number of people I have spoken to have taken the viewpoint "Big bad Bill! How dare he criticise those articles? Who does he think he is?"

Funnily enough Bill spoke to me before his article was published and told me exactly what he had in mind. We had a yarn about different aspects of *Sarcochilus* breeding and he prefers larger flowers. What is wrong with that? I don't particularly, but surely everyone is allowed a viewpoint?

I certainly do not regard Bill's comments as criticism but perhaps more as suggestions.

The David Butler idea of line breeding species to improve them first I feel must be a winner. Particularly when one sees the results and believe it or not we have been on that exact track for quite a number of years ourselves! It is a long road sure but in the long run it will be a worthwhile one.

Overall I think discussions such as these are a must and even though some have obviously had their feathers ruffled the overall winner must be *Sarcochilus* — big or small! **UP THE MIGHTY SARCS!**

Kind regards, Frank Simpson

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37 Brocklesby Road
Medowie, N.S.W. 2318
31st August, 1995

The Editor, *The Orchadian*
Dear Wal,

Well, as I expected, my letter in *The Orchadian* (Vol. 11 No. 8) certainly stirred up a hornet's nest. Four letters in reply in one issue of the journal must be some kind of record. However I was disappointed in the contents. I would ask all the writers to please reread the original article. for example John Woolf asked "How big?" I specified 2X or 2.5X for *Sarcochilus hartmannii* and more specificially flowers of 5–6cm in diameter. I hardly feel such flowers qualify as "dinner plates" as suggested by Lorraine Fagg or "cabbages" as suggested by John Woolf.

The difficulties in breeding *Sarcochilus* (of which I am quite aware) dealt with by David Banks and David Butler apply to all *Sarcochilus* crosses and are not particularly related to breeding larger flowers and are therefore not relevant to my complaint that specific crosses for larger flowers are not being made (except in the case of *S. fitzgeraldii*).

John Woolf pointed out that large flowered plants occur, by chance, in various crosses but this is not the same as aiming for larger flowers in making the crosses. After listing a number of crosses and giving such results he then stated that "if you are looking for large well shaped Australian *Sarcochilus* they are available". Well John, where can I buy them? I tried last year when I visited Florafest but they were NOT available. Existing is not the same as being available. This was the reason for my asking where were the crosses made specifically for larger flowers. If there are markedly larger flowers in existence, where are the crosses using them to produce even larger flowers? Even remakes of some of the crosses John dealt with such as Dorrigo or Burgundy on Ice, using the largest available parents would, I am sure, be eagerly greeted by many growers.

Overall the writers obviously feel that an aim for larger flowers per se is heresay (as I suggested originally). Also it doesn't mean that I want or expect to have only large white flowers.

It is very obvious from all four letters that the writers have a personal preference for small flowers and/or flowers of the size being presently produced. There is no point in arguing about personal preferences. I was just pointing out that there are other people (I am sure I am not alone) who would like to see larger flowers on *Sarcochilus* and that crosses aiming at this are not very common. I have no doubt there is a commercial opportunity here.

There is one point of interest in David Butler's letter I would like to comment on. He said "size seems to be influenced by the pod parent more than the pollen parent". If this is true it may be due to extranuclear DNA (Maternal Inheritance). This non Mendelian inheritance is being reported more frequently nowadays. I have observed it myself in my own plant breeding (but not in orchids) and the only reference to it in orchids that I have seen occurs in *Disa.* The suppression of colour by *Sarcochilus hartmannii* as described by Banks and Woolf in Orchids Australia (Vol. 7 No. 2 April, 1995) and the inheritance of blue colour in *S.* Susan are both possible examples of Maternal Inheritance. Unfortunately details of pod parent and pollen parent in the crosses and in the earlier parents were not given in the article, only the results were quoted, so the suggestion can't be tested. However, any other unusual examples of inheritance in *Sarcochilus* should be reported.

Finally I would like to say that I feel my original article was worthwhile if only that it produced the beautiful photos on the back cover and John Woolf's descriptions of his hybrids.

Yours sincerely,
Bill Morris ✾

AROUND THE GROUPS

NORTHERN REGIONAL COUNCIL A.G.M.

Dave Groffen
31 Arbot Street,
Ferny Grove, Qld. 4055

The weekend of 26-27th August saw the A.N.O.S. Mackay Group host the N.R.C. Annual General Meeting and two days of activities for delegates and visitors who travelled from the Gold Coast, Logan, Brisbane and Maryborough to join local members for an interesting and enjoyable experience.

The programme commenced with lunch at the Andergrove Neighbourhood Centre on the Saturday, followed by the meeting. A new committee was elected consisting of Greig Bolderrow as President, Graham Muller as Secretary, Harry Verroen as Treasurer and Lyn Verroen as vice President. The outgoing President, John Hazelwood, thanked all committee members for their efforts in setting up the Council, in particular Jim Male for his expertise in this regard and the Verroens for their work resulting in incorporation.

Plate 45: *Dendrobium speciosum* var. *curvicaule*, a very good form with large labellum.

Plate 46: *Dendrobium speciosum*, in large clumps were a common sight.

Plate 47: *Dendrobium aemulum*, plants grow right down to almost ground level.

Plate 48: *Caladenia carnea*, a "triple header" said to be common in Eungella.

Above photos: D. Groffen

Plate 49: President Barry Collins (on right) congratulating Janet and Bob Napier on receiving A.N.O.S. Life Membership.
Photo: W. T. Upton

Decisions taken by the Ordinary Meeting which followed the A.G.M. included adopting *Pseudovanilla foliata* as the N.R.C.'s emblem and empowering a subcommittee headed by Lyn Verroen to arrange for the first Kenneth Alexander MacPherson Memorial Lecture to be presented at the next suitable function. A letter from the A.N.O.S. (Qld.) Judging Panel concerning details of the course to be conducted in 1996-97 was tabled and it was decided to include it with the minutes to all member societies in order to invite expressions of interest via society bulletins.

After the meeting, local bushhouses belonging to Ron Bassan, Harry and Lyn Verroen, Rob and Karen Norman and Lew Dovey were visited. These collections were varied and interesting, featuring many species orchids, both Australasian and exotic. All were extremely well grown, with many plants grown outdoors on and under trees in the garden.

A very tasty barbecue meal, prepared by Noeline Quinlan, was ready at the hall on our return and following the meal we were treated to a guest speaker in the form of Steve Pearson, one of the rangers working at Eungella National Park. Steve and his wife Allison are very interested in and knowledgeable about native orchids as well as many other plant species which grow in the park. Steve's slides were mainly of unusual forms and/or varieties of orchid species known from elsewhere, which appear to grow exclusively in Eungella. Examples of these were forms of *Caladenia carnea, Acianthus sublestus, Plectorrhiza tridentata* and *Dendrobium teretifolium.*

A trip to view the orchids of the area in situ was arranged for Sunday and six vehicles, mainly 4WD, set out for Eungella at 7.30 a.m. This trip turned out to be a highlight of the weekend and it was indeed a pity that some members from "down south" were unable to extend their stay an extra day in order to experience it.

The areas visited were quite rich in orchid species, both epiphytic (Plate 46) and terrestrial. We are indebted to Steve Pearson, who joined the excursion with his family and acted as our guide. Species observed in flower included: *D. linguiforme* (both the type form and var. *nugentii*), *D. gracillicaule, D.* X*gracillimum, D. speciosum* var. *curvicaule* (plate 45), *D. teretifolium* (local undescribed variety), *D. tetragonum, D. aemulum* (Plate 47) (both the brush box form and the ironbark form), *Bulbophyllum schillerianum* (formerly *B. aurantiacum*), *Caladenia carnea* (Plate 48) (several forms, some undescribed) and *Thelymitra pauciflora.*

The *Dendrobium* speciosums in particular were plentiful and a magnificent sight in full flower. The average form was very good, with many specimens having excellent shape, size and colour, which ranged from cream to bright lemon yellow. It is often said that the most horticulturally desirable plants come from this area and I believe it! Several large specimens of the local *D. teretifolium* also made a beautiful display, this form has quite large flowers of a nice cream colour with deep maroon markings on the labellum and towards the centre of the segments. An interesting feature of the *D. aemulum* noticed was that many plants covered each tree on which they occurred and they were located at all levels, from almost ground level upwards.

Many more species were observed not in flower and these included: *D. bowmanii, D. racemosum, D. canaliculatum, D. discolor, Oberonia complanata* (formerly *O. meulleriana*), *O. titania* (formerly *O. palmicola*), *Bulbophyllum macphersonii, Plectorrhiza tridentata, Pterostylis* spp. (probably *P. nutans*), and *Geodorum neocalidonicum* (formerly *G. pictum*).

Add to this a charge by a group of wild pigs, a stop to pick "bush" lemons at the ruins of an old loggers' camp and the discovery of a site used to cultivate something other than native plants and it can be seen that the day was full of interest and excitement. It ended with a visit to Kevin and Marian Crouther's home at the township of Eungella where our hosts were kind enough to provide a late afternoon tea and show us their orchid collection. A very full day finished back at Mackay at 7.30 p.m.

The visitors all wish to thank their billets and hosts for their wonderful hospitality and a most enjoyable and educational weekend. ✤

A.N.O.S.
ANNUAL GENERAL MEETING No. 32

Bob Napier

The 32nd A.G.M. was held at the scenic Wollongong Botanic Gardens, courtesy of Steve Popple, President of W. & D.N.O.S. Steve, unhappily was unable to attend, being on an extended holiday touring the country.

There were 26 attendees amongst whom it was most gratifying to welcome Gerry Carne, Ron and Gwen Robjohns from N.O.S.S.A. and our first visitor from Mid-North Coast Group, John Donnelly.

The meeting was opened by the retiring President who reported steady progress, congratulated the Editor, Wal Upton and the Central Coast Group on the largest Orchadian to date and thanked both Wal and Jill Upton for his decision to carry on as Editor for one more year. He thanked all members of Council for their assistance during the year, touched on the setting up of an Australasia-wide A.N.O.S. body (a full report was given in the Advisory Committee) and our invitation from Graeme Banks — the President of A.O.C. — to apply for Associate Membership.

The Treasurer, Janet Napier, tabled her report, revealing an improvement in our reserves of almost $3,500; Colour Fund contributions being up by 36%; Conservation account being steady and the Judging Panel dropping off a little. The Society's financial reports as lodged with the Department of Consumer Affairs are published elsewhere in this issue.

Wal Upton reported a record total of 208 pages printed in *The Orchadian* during the year of which 37 pages were colour, he feels that the content is well balanced but possibly more cultural articles would be in order. He thanked, by name, all his helpers on the Central Coast and our authors without whom there would be no Orchadian.

Alan Dash presented the Conservation Officer's report touching on the Data Base Project (see Graeme Bradburn's article *The Orchadian* Vol. 11 No. 5); threatened sites; the Tuberoid Bank administered by Macarthur Group; the Conservation Badge and the Conservation Camp on 4th November at Taree.

In the absence of Darryl Smedley, Jim Lykos tabled the Judging Panel report setting out continued progress in N.S.W. and Queensland with new panels for W.A. and S.A. and a start in N.Z. Progress has also been made in an updated handbook and trial standards for judging terrestrial orchids. He also paid tribute to Don Barnham (a foundation member of the Society) who, after 15 years, has relinquished his position as an A.N.O.S. judge.

The Chairman then declared all Council positions vacant and passed control of the meeting to Murray Corrigan who, after receiving the nominations to Council, declared that as the number of candidates equalled the positions to be filled, the Council as listed on the contents page of this Orchadian issue was elected.

The new President, Barry Collins, then took the chair. Brief reports were received from those Group Representatives present and Gerry Carne gave a progress report on the 3rd Conference and Show in Adelaide, 1996, hosted by N.O.S.S.A.

At the conclusion of the meeting, Barry Collins proposed that Life Memberships be offered to Janet and Bob Napier. This was formally moved by Wal Upton and seconded by Murray Corrigan and passed by acclamation (Plate 49).

The Advisory Committee Meeting was opened by the President and report received on progress with a centralised A.N.O.S. body from the sub-committee formed at the 1994 meeting.

A deadline for operation had been set for 1st July, 1995 and recommendations for a central council were circulated to all Groups and Councils in Australia and New Zealand. Acceptance in principle had been indicated by all concerned and only minor procedural matters remain to be resolved. The new body will be called "The Australasian Council of Native Orchid Societies" (A.C.N.O.S.) and initially will mainly be concerned with co-ordinating our activities especially in Conservation and Judging matters; to this end the National Registrar of Judges has been accepted as an ex-officio member of A.C.N.O.S. and appointment of a Conservation Co-ordinator with full voting rights is being actively pursued.

Rob Trevenar asked that with A.N.O.S. Inc. taking on responsibilities for N.S.W. only, what role is left for the Advisory Committee vis-a-vis interstate bodies. It was agreed that this should receive urgent consideration by Council.

The meeting closed at 3.00 p.m. with some members adjourning to Graeme Bradburn's home for a session with his computer and a demonstration of the use of Internet.

It was disappointing that full advantage could not be taken of the gardens during the luncheon break due to the low temperatures outside. This however was balanced by the warm hospitality later at Rob Trevenar's and Maureen Flynn's home followed by a slow and careful return to Sydney and points north afterwards.

The 1996 A.G.M. will return to Gosford on 3rd August. There is a real problem in reserving a suitable hall in the Sydney area on a Saturday as John Riley, Ruth Rudkin and I know, having made unsuccessful attempts to have Macarthur, Warringah and Port Hacking groups take their turns in hosting an A.G.M.

AUSTRALASIAN NATIVE ORCHID SOCIETY INC.
Statement of Receipts and Expenditure for year ending 30/6/1995

RECEIPTS	$
The Orchadian – Subscriptions	20,329.00
– Colour Fund	1,262.00
– Sales of Back Issues	499.00
– Advertising	1,375.00
Conservation – Badge Sales	530.00
– Tuber Bank	665.00
– Refund Expenses	14.94
Conferences 1st – Badge Sales	6.00
– Sale Proceedings	34.00
2nd – Badge Sales	25.00
– Sale Proceedings	34.00
Judging Panel – Donations	150.00
– Award Fees	100.00
Sales Items – John Riley Prints	80.00
– A.N.O.S. Vic. Culture Book	168.00
– Hybrid List	514.00
– A.N.O.S. Medallions	540.00
– Group Badges	15.00
– A.N.O.S. Badges	15.00
– W.A. Book	6.00
Donations	70.00
Bank Interest	451.69
Postage	22.05
Group Member Fees	334.00
Family Member Fees	52.00
	27,291.68
Unpresented Cheques 1994/5	50.00
Opening Cash 1/7/1994	19,743.20
	$47,084.88

EXPENDITURE	$
The Orchadian – Refund Subscriptions	300.00
– Printing	14,169.80
– Postage	2,432.10
– Editorial Expenses	287.91
Conservation – Badge Cost	700.00
– Donation (Anglesea)	500.00
Affiliation Fees (O.S. of N.S.W.)	99.00
Conferences 2nd – Cost Proceedings	68.00
F.T.D. Investment	10,000
Service on Typewriter	45.00
Judging Panel – Registrar Expenses	225.33
– Judging Course Expenses	198.80
– Cost of Award Certificates	110.00
Sales Items – John Riley Prints	80.00
– Cost A.N.O.S. Vic. Book	143.50
– H/List refund overpayment	10.00
– Cost of Medallions	362.50
– Cost of Badges	10.00
Rent	220.00
A.C.N.O.S. Expenses	411.20
Donations	304.00
Bank & Credit Card Charges	397.58
Postage	531.40
Printing A.N.O.S. Constitution (Rules)	338.80
Insurance	231.45
Incorporation Fees	30.00
Photocopying	439.85
Phone and Stationery	448.72
	33,094.94
Unpresented Cheques 1993/94	14.94
Closing Cash 30/6/1995	13,975.00
	$47,084.88

We also have $17,324.27 in F.T.D. Account with A.N.Z.

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Statement of Assets and Liabilities as at 30/6/1995

ASSETS	$	$
Cash on hand	NIL	
Cash in Bank	13,975.00	
Term Deposits	17,324.27	31,299.27
Stock – Western Australia and Victorian Books	172.00	
– *The Orchadian* Back Issues	2,585.00	
– Hybrid Lists	487.00	
1st Conference Proceedings	504.00	
Badges – various	3,992.00	
Medallions and cases	320.00	8,060.00
Equipment – Typewriter	204.00	
– Heat sealers (2)	248.00	452.00
		$39,811.27

LIABILITIES	
Subscriptions in advance	14,014.00
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Plate 50: Display of terrestrial orchids at Warringah Group Spring Show.

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The Orchadian

Volume 11, Number 11 March, 1996

Royal Botanic Gardens
and National Herbarium

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June issue – 31st March.
September issue – 30th June.
December issue – 30th September.
March issue – 31st December.

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TALKING POINT

Another bumper issue; another 64 pages!

Thanks to the growing number of authors and the members' greater interest in their own native orchid journal, the future looks good for *The Orchadian.*

In this issue, I am reprinting two articles from "The Lecture Notes of *A Weekend in Maryborough*", held last May, I am sure they will be of great interest. Alick Dockrill's "An Introduction to the main Nineteenth Century Contributors to our Botanic Knowledge about Australian Orchids" contains a wealth of information about those botanists and native orchid enthusiasts of the nineteenth century, who were the originators of the real and solid base on which our hobby was built.

Now, only 200 years, from our humble beginnings, the world is fully aware of our unique native orchid flora. Over the past 32 years *The Orchadian* has been in the forefront of presenting our native orchids to the world. We are frequently quoted in overseas journals as well as in our own Australian ones. In the *Orchid Research Newsletter* from Kew, articles from *The Orchadian* are often mentioned. We have our own page on "The Internet".

I never cease to be amazed at the number of people, both here and overseas, who grow our native orchids; it is getting to a stage where nearly all orchid growers have at least a few natives; in many instances they can be grown with the cymbidiums to add that needed variety.

Hybrids are ever increasing, note the "Australian Native Orchid Hybrid Registrations" on page 539, no less than 45 since the December issue. *Sarcochilus* hybrids are now being registered at an increased rate, 113 already and the first *Sarcochilus* hybrid was not made till 1963. Our total hybrids of purely Australian native orchid parents is now approaching 870.

Conservation is very much alive in Australia and well practiced by our groups and individual members. Pay particular attention to Alan Dash, our Conservation Officer's "Development of a Practical, Achievable Conservation Policy", commencing on page 552, there is much commonsense in this, so bear in mind his remarks under "What can we do?" and "How then can A.N.O.S. be most effective?"; it must be thoroughly digested and acted upon.

Walter T. Upton

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GASTRODIA URCEOLATA D. Jones — SOME NOTES ON A RARE SPECIES

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CMB 16, Paluma 4816
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Dalrymple Heights 4757

This quite large saprophytic species was first collected by Len Lawler at Moomin near Atherton in 1988 and was described by Dave Jones in 1991. Since then Bruce Gray informs us he has seen it in several locations on the Atherton Tableland, but the only written records are the publication by Jones and Dockrill's *Australian Indigenous Orchids Volume 1* (1992) which repeated the information published previously. The species has also been seen on the Eungella plateau west of Mackay. Roy Mackay of Paluma recently discovered plants of this species about 10 km west of Paluma township.

Eungella is about 550 km south of the type locality, so this represents a significant extension of range. Probably the species occurs anywhere in the tall open forests (or wet sclerophyll forests) which form a long narrow band in the ecotone area between the rainforests of the wet tropics and the drier open forests to the west. This band stretches from a little south of Cooktown to Mt Elliot, just south of Townsville — a total distance of about 450 km. There is then a gap south of Townsville of about 200 km where the rainfall is too low, before the habitat again occurs at Eungella. It occurs at altitudes ranging between about 400m and about 1,500m and common species include flooded gum (*Eucalyptus grandis*) and forest oak (*Casuarina torulosa*). At the Paluma site these species were common and along with a bloodwood and turpentine (*Syncarpia glomulifera*) formed a closed canopy. The understorey varied from very open to quite dense with *Melastoma, Pimelea, Dianella* and blady grass (*Imperata cylindrica*). The soil is a grey sandy loam with about 4cm of leaf litter on the surface. The habitat is subject to fires on a reasonably regular basis, but had not been burnt for at least a year. The altitude is about 875m.

The Eungella population grows in tall open forests just to the west of the rainforests. The dominant trees are *Eucalyptus andewsii* in some areas and bloodwoods and *Lophestemon suaveolens* in others. As with the Paluma plants, casuarinas are a constant feature of the habitats. The Eungella plants are shorter on the average than the Paluma population with few plants exceeding 60cm in height.

The Paluma plants tend to occur in loose colonies and as individuals. One colony included upwards of 40 plants in an area about 80m by 80m. In other places the plants grew singly or in groups of three or four. The flower racemes varied in height from 10 to 130cm (which is considerably taller than those described by Jones). Up to 50 flowers were counted on one particularly large plant with seed capsules at the base of the inflorescence and small unopened buds at the apex. About 13 flowers were open on this plant. The flowers are white as described by Jones, but tend to become brownish-yellow as they age.

The Paluma plants were in varying stages of development, ranging from small shoots just emerging from the forest floor to large mature plants when seen on 22nd November. Our guess is that the flowering season would be mid-October to mid-December. Large plants must be in flower for at least three or four weeks and this, along with their local abundance, leads one to wonder why this species was not discovered until 1988.

The more or less mature capsules are about 15mm by 8mm. Smaller capsules, presumably unfertilised, drop off if touched but the larger (fertilised?) capsules hang on to the plant. The largest tuber excavated was 10cm by 3cm. Most of the tubers lay on top of the soil, buried in about 3cm or 4cm of leaf litter, but some were shallowly buried in the soil. They are very fragile and attenuate to a slender rhizome which penetrates the soil. There appeared to be no obvious correlation with rotting logs or stumps as has been suggested previously.

This is a most distinctive species and is not particularly similar to the well known *Gastrodia sesamoides* which occurs further south and is very different from the other north Queensland species *G. queenslandica,* which occurs in the lowlands. The tall inflorescences of upright white flowers are sufficient to distinquish it from any other Australian species.

Jones proposed a conservation rating of 2K, but this should be altered to 3R now that more is known of the distribution. It occurs in the World Heritage Area and is protected by this to some extent and is probably in National Parks as well. The tall open forest habitat is somewhat fragile and could suffer a long term decline through the expansion of rainforests, or at the opposite extreme, from wildfires in times of extreme drought. The Eungella populations are not known from the National Park and many be under some pressure from cattle grazing. As it is a saprophyte, it is under virtually no pressure from collectors.

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Dockrill, A. W., 1992. *Australian Indigenous Orchids.* pp 262-263. Surrey Beattie & Sons in assoc. with Society for Growing Australian Plants, Chipping Norton, N.S.W.

Jones, D. L., 1991. New Taxa of Australian Orchidaceae. *Australian Orchid Research* 2: 64, 65 and fig. 84. ✽

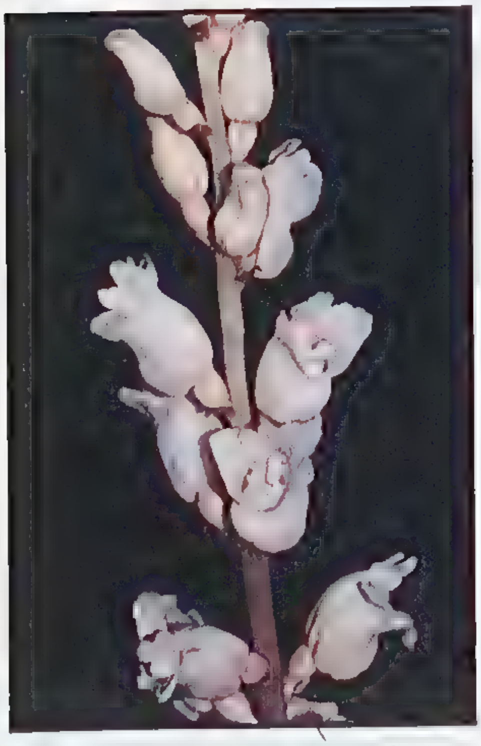

Plate 1: *Gastrodia urceolata* – Paluma. Photo: P. Lavarack

Plate 2: Habitat Paluma. Photo: P. Lavarack

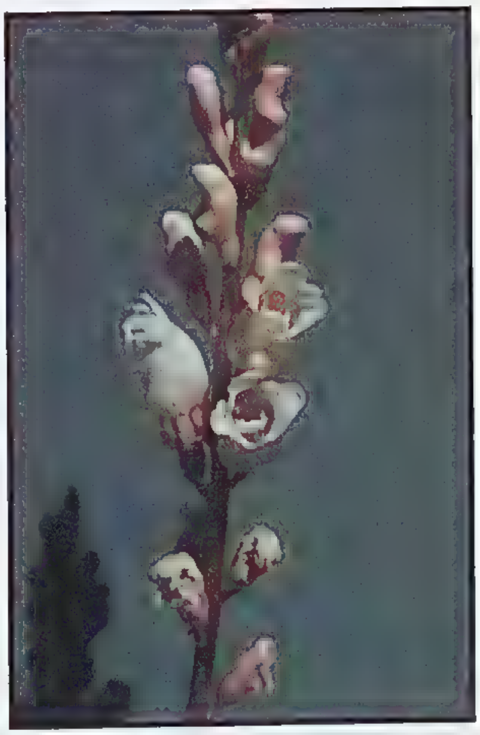

Plate 3: *Gastrodia urceolata* – Eungella. Photo: S. Pearson

MORE LIGHT ON SUN ORCHIDS

Les Nesbitt
P.O. Box 72
Walkerville, S.A. 5081

INTRODUCTION

For years orchid lovers have speculated on the origin of deep pink sun orchid hybrids and whether the deep pink *Thelymitra Xmacmillanii* (Plate 9) was a hybrid. The theory often put forward was that blue crossed with yellow gave pink. This theory was based on the beautiful dark pink natural hybrids and the possible parent species growing nearby. Now every kindy kid knows that if you mix blue paint with yellow paint you get green paint. Why should Australian sun orchids be different? Thankfully not everything in this world is black and white.

In the late '80s I made a number of crosses to test this theory because I was curious and sceptical. Over the past few years seedlings from a number of these crosses have flowered. Some of the results were surprising whilst others were predictable. One of the surprises was that blue crossed with yellow can produce the most glorious deep pink, as close to red as possible and still be pink. Another surprise was that the pigments from both parents often reappear undiminished in the hybrid creating very intense coloured flowers.

Sun orchid (*Thelymitra*) flowers close at night and require a warm day to open. A temperature of 20–25°C is needed, corresponding to the conditions when the pollinating bees are active. In September-October this may be only two days each week. The habit of closing flowers does not suit orchid shows which are usually held in cold dim halls in the spring flowering season. Orchids in bud do not impress the judges or the public. Consequently sun orchids are seldom seen at their best. A massed display of fully open, sweetly perfumed sun orchids in every colour of the rainbow is a sight to behold. With the help of a little modern technology we expect to provide such a display at the Australasian Native Orchid Conference at Flinders University in Adelaide from 27th to 30th September this year. Sun orchids will be just one of many highlights to delight you at the '96 Adelaide Conference.

SPECIES

Sun orchid hybridising has barely started. When I began I used the few species that I had available at the time. These were:–

Thelymitra antennifera (Plate 5) (Rabbit Ears) — This miniature species carries up to four beautiful yellow flowers to 30mm across. The backs of the sepals are usually stained reddish orange. On a warm day the flowers emit a strong vanilla fragrance. Each plant has a single fleshy leaf (normal for the genus *Thelymitra*) and produces up to three small bullet-shaped tubers. There are two long brown projections on the top of the column and a yellow furry nose between, hence the common name rabbit ears. "Antennifera" hybrids have hybrid vigour, flower freely and multiply at an annual rate of 2.5:1. They can be any colour but lose most of the perfume. A very successful parent.

Thelymitra luteocilium (Salmon Sun Orchid) — This species has 3–5 pale pink 30mm flowers with yellow hair tufts on the front of the column. Plants grow to 250mm tall and the increase rate is 1.9. Easy to grow and free flowering. Self pollinating after about 10–14 days. *T. luteocilium* had a strong influence on the colour of the only hybrid flowered.

Thelymitra rubra (Plate 6) (Pink Sun Orchid) — Sometimes confused with *T. luteocilium* because size, colour and habit are similar. Carries 2–4 flowers, usually pink but can vary from yellow to biscuit to a very dark pink. Some clones have filled-in flowers with broad overlapping tepals. Flowers are self pollinating after about a week or so. The column does not have hair tufts. There are vertical yellow teeth on top of the reddish column. With a low increase rate of about 1.2, this species is not as easy as some in cultivation. *T. rubra* hybrids are easier to grow but do not multiply well unless the other parent is a fast multiplier. Passes on the pink colour to hybrids.

Thelymitra nuda (Plate 10) (Scented Sun Orchid) — Really a complex of varieties which someone will split up one day. My clones do not have much perfume so the common name is a misnomer. The normal form from the Adelaide Hills grows to about 400mm tall and carries 4–6 pale blue flowers in September-October. The flowers are up to 40mm across and open at a lower temperature than other species. The column has a brown fleshy bulbous top with a cleft in the front. Hair tufts are white. The species does not set seed on its own. Increase rate is 1.5 and is easy to grow although only large tubers flower and in some years a cluster of small tubers are produced which have to be grown on for another season or two. Flowering tubers are as big as pigeon's eggs.

I have named several clones used in my breeding program:–

T. nuda 'Royal Blue' (Plates 8 & 11) has up to 12 deep purple-blue flowers to 40mm in diameter. It grows to 400mm tall and flowers later than the common form. It produces rich coloured progeny.

T. nuda 'Tall Blue' (Plates 14) has 3–6, 50mm diameter pale blue flowers on a plant 550mm tall. No hybrids have flowered yet.

T. nuda 'Tall White' (Plates 12) is very similar but the flowers are pure white. All of these *T. nuda* clones originated in South Australia.

HYBRIDS

The hybrids flowered are:–

Thelymitra Melon Glow (Plate 18) = *T. antennifera* X *T. luteocilium* — *T.* Melon Glow has pale pink flowers with some clones shading to peach tones. It is an easily grown, free flowering hybrid. Plants grow to 350mm tall and bear 3–5 flowers 30mm in diameter with yellow column antennae. Increase rate is good at 2.5 and flowers are not self pollinating.

Thelymitra Kay Nesbitt (Plate 4 & 15) = *T. antennifera* X *T. rubra* — Hybrids vary in colour from pink to orange. The best clones are very intense deep pink, real jewels of the bush house. I have remade this cross several times. No. 457 using a deep pink clone of *T. rubra* has produced some outstanding seedlings of excellent shape and rich colour. Plants carry 2–4 flowers up to 30mm across on stems 350mm tall. The flowers have dark maroon antennae on the column and a thin yellow nose.

Thelymitra nuda X *T. antennifera* (Plate 16) — The first seedlings to flower of No. 397, using a blue *T. nuda,* turned out to be a deep rich pink with yellow antennae. Of all these hybrids this is the closest to my plants of *T.* X*macmillanii.* The column is wide and hollow with thin sharp edges. The first three seedlings flowered in 1995 with up to five flowers.

No. 410 using *T. nuda* 'Tall White' produced 2–3 fragrant yellow flowers 34mm wide with yellow antennae resembling a taller and larger *T. antennifera.* Both crosses have an increase rate of 2.5.

Thelymitra nuda X *T. rubra* (Plates 7, 17 & 19) — No. 408 *T. nuda* 'Tall White' X *T. rubra* resulted in tall plants to 400mm bearing 2–5 shapely pale pink flowers with a mauve flush. The column is red with yellow hair tufts. Plants barely increase at a rate of 1.1.

No. 458 *T. nuda* 'Royal Blue' X *T. rubra* 'Very Dark Pink' has 28mm diameter colourful pink flowers with a purple overlay. First flowering seedlings in 1995 had 2–3 flowers on plants 340mm tall. This hybrid should produce more flowers when the plants get bigger.

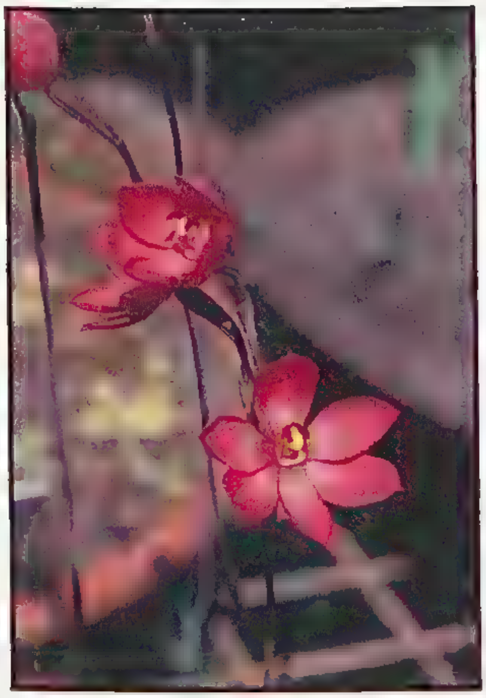

Plate 4: *Thelymitra* Kay Nesbitt (No. 457).

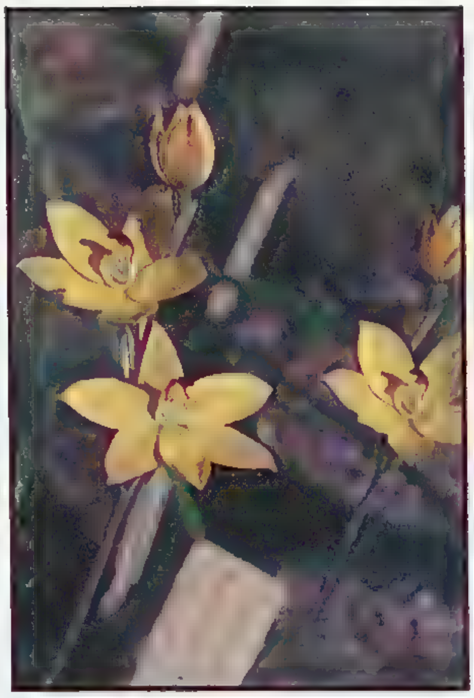

Plate 5: *Thelymitra antennifera.*

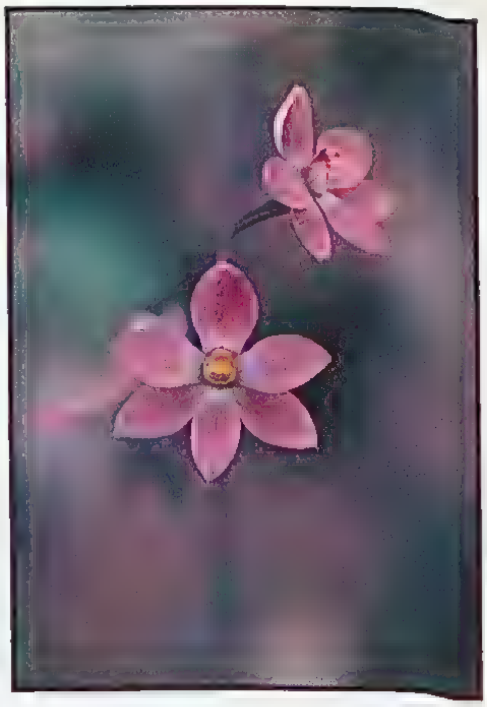

Plate 6: *Thelymitra rubra.*

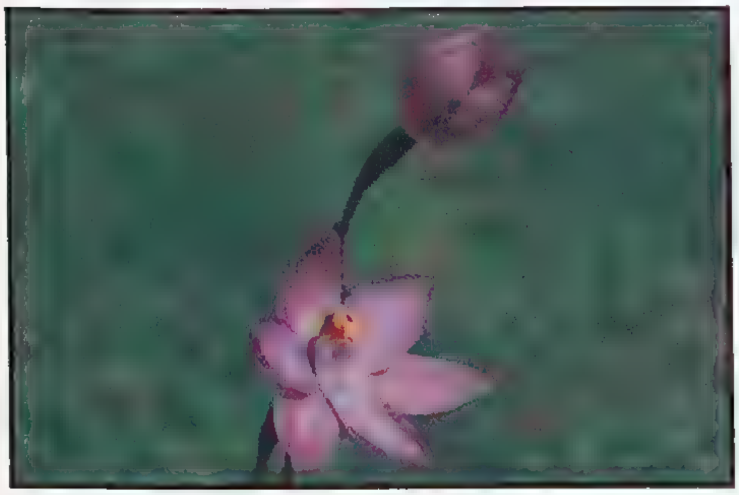

Plate 7: *Thelymitra nuda* 'Royal Blue' X *T. rubra.*

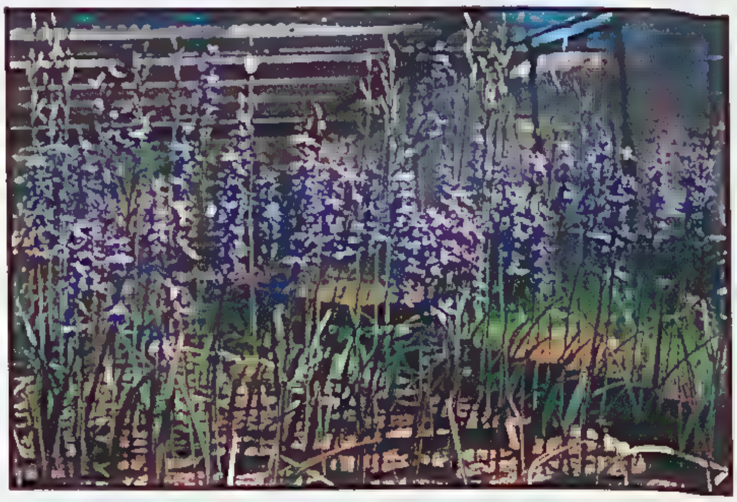

Plate 8: *Thelymitra nuda* 'Royal Blue'.

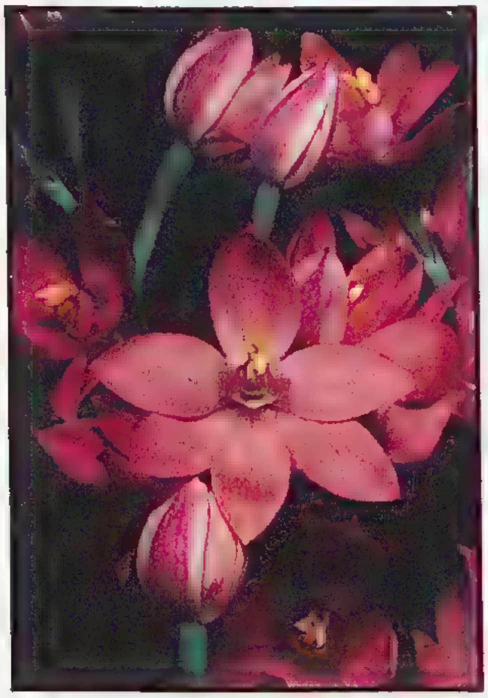

Plate 9: *Thelymitra Xmacmillanii.*

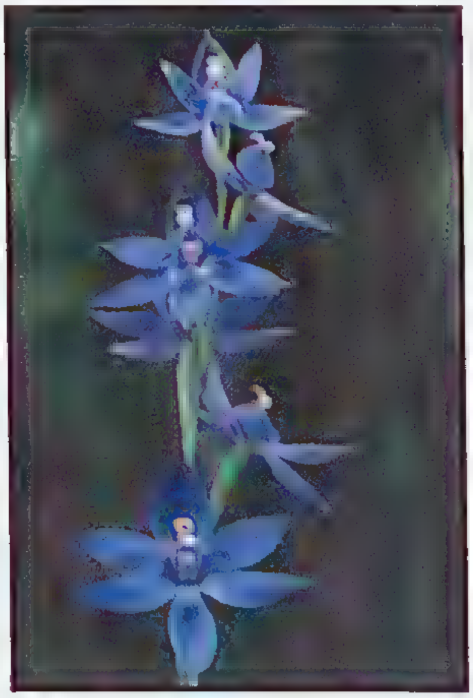

Plate 10: *Thelymitra nuda* common form.

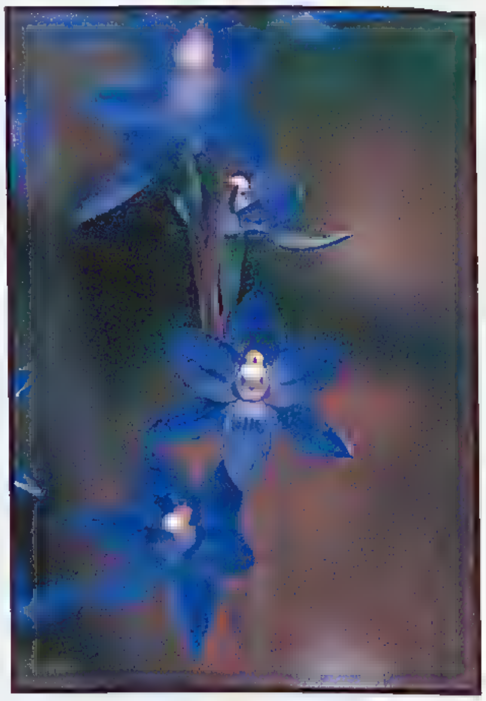

Plate 11: *Thelymitra nuda* 'Royal Blue'.

Photos by L. Nesbitt.

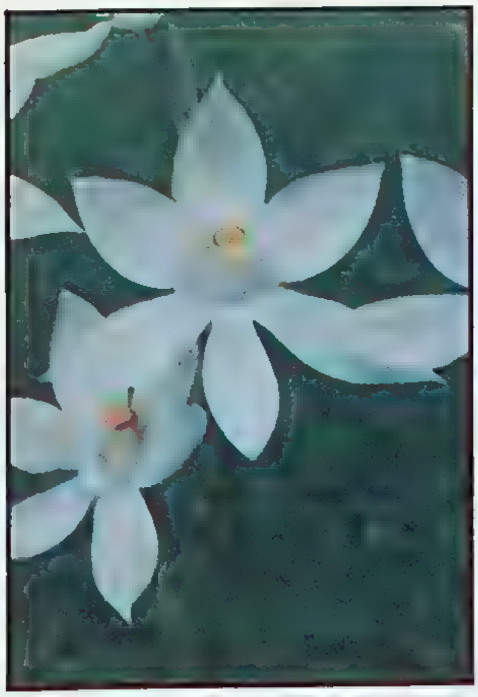

Plate 12: *Thelymitra nuda* 'Tall White'.

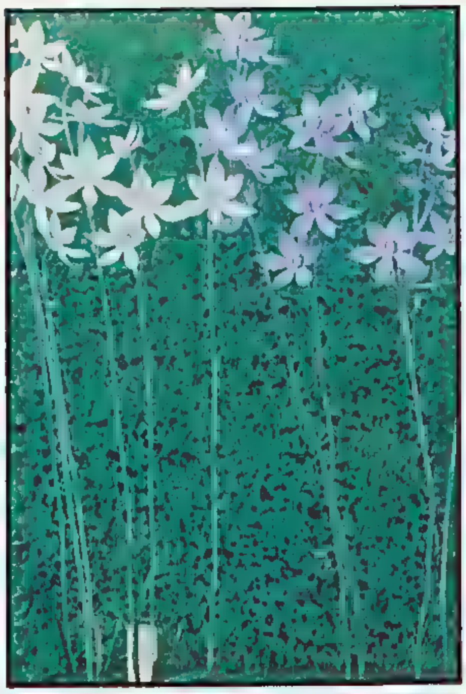

Plate 13: *Thelymitra nuda* 'Tall White' and 'Tall Blue'.

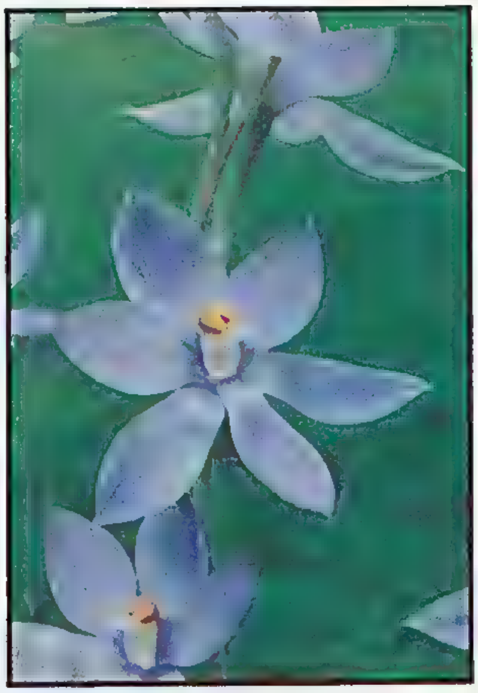

Plate 14: *Thelymitra nuda* 'Tall Blue'.

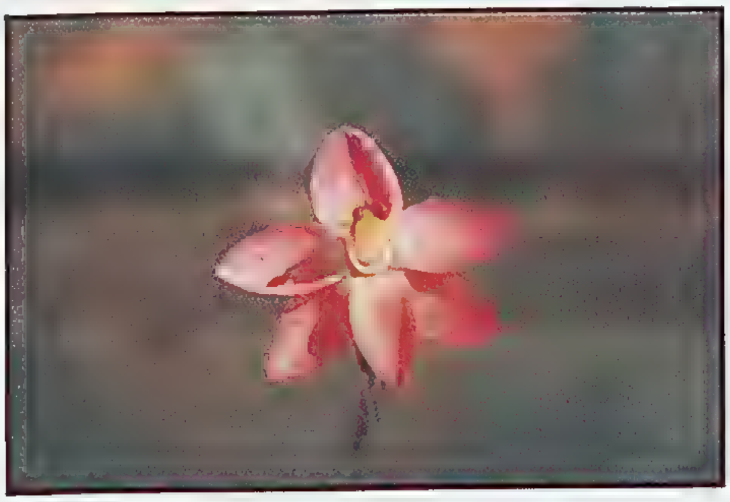

Plate 15: *Thelymitra* Kay Nesbitt (No. 457).

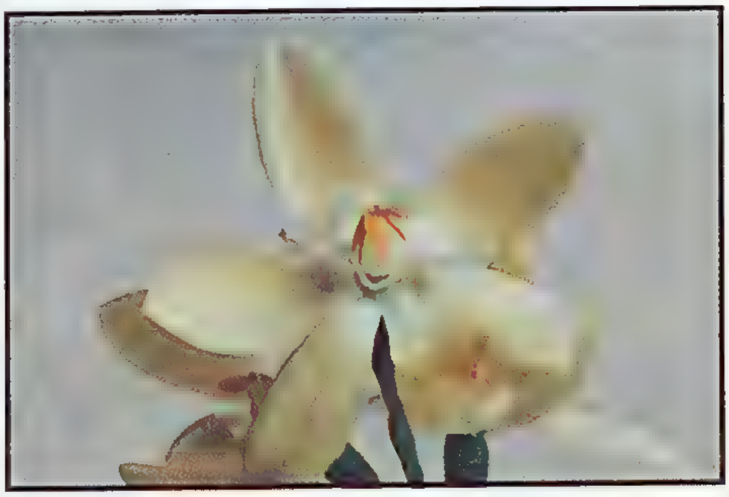

Plate 16: *Thelymitra nuda* 'Tall White' X *T. anntennifera.*

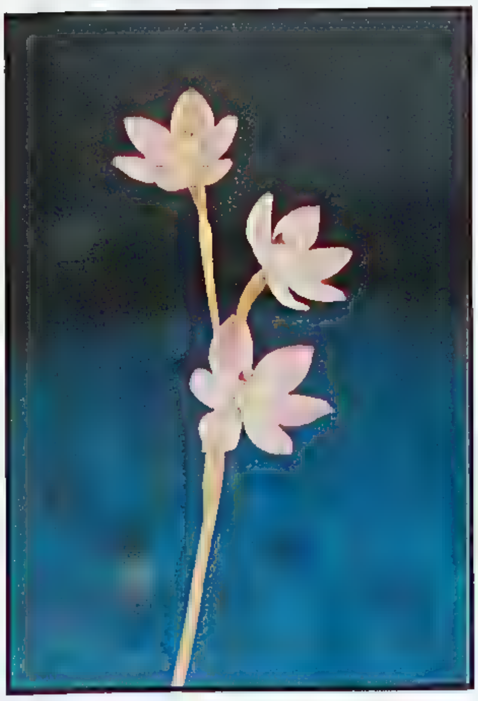

Plate 17: *Thelymitra nuda* 'Tall White' X *T. rubra* (No. 408).

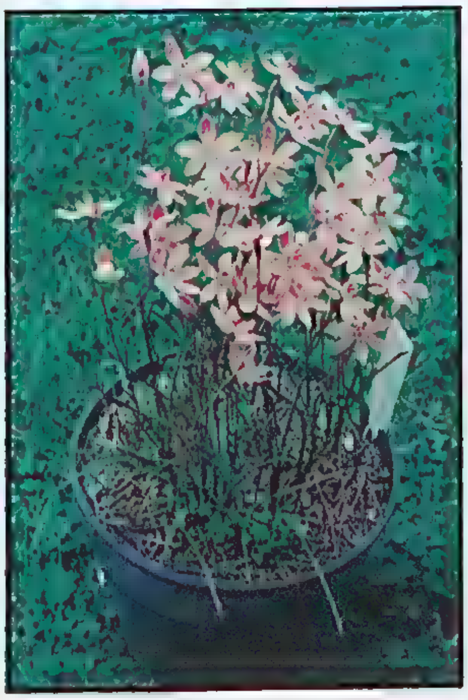

Plate 18: *Thelymitra* Melon Glow.

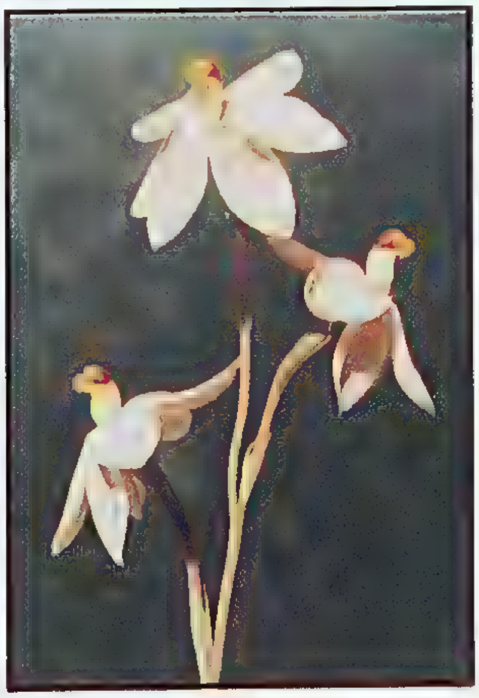

Plate 19: *Thelymitra nuda* 'Tall White' X *T. rubra* (No. 408).

Photos by L. Nesbitt.

CULTURE

I grow *Thelymitra* in 125–150–175mm plastic pots under 50% shadecloth. They have vigorous root systems and appreciate a heavier than standard soil mix, the same as *Diuris*. They must have good air movement and don't like to be hot and wet as they are going dormant. I try to repot the larger tuber types as soon as they go dormant each year. *Thelymitra* don't mind being overcrowded and 15–20 plants in a 175mm pot make an attractive display. I get better tuber growth at the Kersbrook Nursery in the Adelaide Hills where it is colder and wetter in winter-spring than on the Adelaide Plains. The larger types of *Thelymitra* seem to be more difficult to manage in cultivation and propagation is slow to negative for such species as *T. grandiflora, T. ixioides, T. epipactoides, T. crinita* and *T. benthamiana.* We are attempting to raise seedlings and make hybrids with these attractive large species.

Slugs and snails love to eat sun orchids and aphids are attracted to the flowers and buds. Diseases to watch out for are virus, rust and various rots.

CONCLUSION

With more species in the hybridising program a wider range of colours and plant sizes is in the pipeline. Every colour of the rainbow occurs in sun orchids. When we perfect our prototype flowering cabinets and can get flowers to open at the flick of a switch then everyone will take notice. These flowers are round, filled in, perfectly symmetrical, stand up and look at you and have glorious colours plus perfume.

Come to Adelaide in September and you can see them at the Conference and on the bush walks. For a registration form write to: Honorary Secretary N.O.S.S.A, P.O. Box 565, Unley, S.A. 5061. Registration is $125 or if you register before 31st March, 1996 it is only $100. ✤

DENDROBIUM YONDI 'KAYENA' — SURVIVES, THRIVES

Ted Gogerly

Dendrobium Yondi 'Kayena' (Plates 20 & 21) came to me in 1986 as a gift from Sid Batchelor, well-known hybridizer of Australian native orchids. Sid told me at the time that 'Kayena' (named after a Tasmanian town) was one of his prized seedlings and that the plant he had given me was, in fact, the entire clone.

Potted in a mixture of bark and blue metal and given frequent applications of half strength Aquasol© (weekly, weakly), 'Kayena' responded generously in both growth and flower production. It won Popular Vote at the September, 1989, meeting of the Orchid Society of New South Wales immediately following which I entered it in a two day out-of-town orchid show, where it was adjudged Champion *Dendrobium*.

Unfortunately, my pride and joy disappeared mysteriously overnight: plant, pot, name tag, prize card simply weren't there any more and have not been sighted since.

I was, of course, devastated; particularly so because I did not have a reserve plant. However, I could not help being intrigued by the reaction of others: a pall of gloom fell over the whole proceedings, much as though there had been a death in the family. Many people, some of them complete strangers, offered their condolences and some even gave me pieces of their own precious plants in an attempt to soften the blow. It was a heart-warming experience.

When I returned to Sydney, Margaret Barrett, a member of my local (Berowra) Orchid Society, reminded me that I had given her two keikis of *D.* Yondi 'Kayena' some short time before, a fact that I had completely forgotten. In a typically generous gesture, she returned them to me in the hope that they might be the means by which 'Kayena' could be regenerated. (It is interesting to note that, as far as I am aware, those were the only aerial growths that this clone has ever produced).

The two keikis hardly inspired one with confidence. Approximately 75mm long, with small root systems, the more robust of them had two leaves, while the other boasted only one. I handed them over to Wal Rhodes, who is best known for his paphiopedilums but who also has a well-deserved reputation as a "rescue and resuscitation" specialist with ailing orchid plants.

Under Wal's tender ministrations, the two heroes became established and grew remarkably well. In due course, he handed the larger of them over to me, with threats of blood-chilling retribution should I fail to do the right thing by it. (He had returned the smaller plant, which continues to thrive).

My plant, given the same treatment as that applied to the original, has grown with remarkable vigour, doubling in size each year. The flowering in 1994 was so pleasing that I entered it in a show, confident that it must have a real chance of top honours. Predictably, perhaps, it gained only second place in its class, much to the surprise and disappointment of myself and not a few others.

Apparently stung by that rebuff 'Kayena' really put its best foot forward in 1995, producing 77 spikes (counted as they were removed from the plant after flowering), with some 700–800 flowers tightly packed within a circle 450mm in diameter. Entered in the spring show of the Berowra and Districts Orchid Society (Inc.) it was adjudged Champion Australian Native, Best Specimen Australian Native and Best Coloured Orchid. It also gained an Award of Merit from the Orchid Society of New South Wales, whilst the Australasian Native Orchid Society granted it an Award of Merit and an Award of Cultural Commendation.

The theft of the plant in 1989 attracted a surprising amount of publicity and interest among orchid growers. In the intervening years, I have travelled from one end of New South Wales to the other and, wherever I've gone, there have been enquiries as to whether there has been any news of its whereabouts. I know there are many people of good will who will share my delight that *D.* Yondi 'Kayena' has not only survived, but has also been given official recognition as a very special plant. ✽

Newcastle Group
A.N.O.S.

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SHOW

NATIVE
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at Newcastle City Hall

on 20th-21st April, 1996

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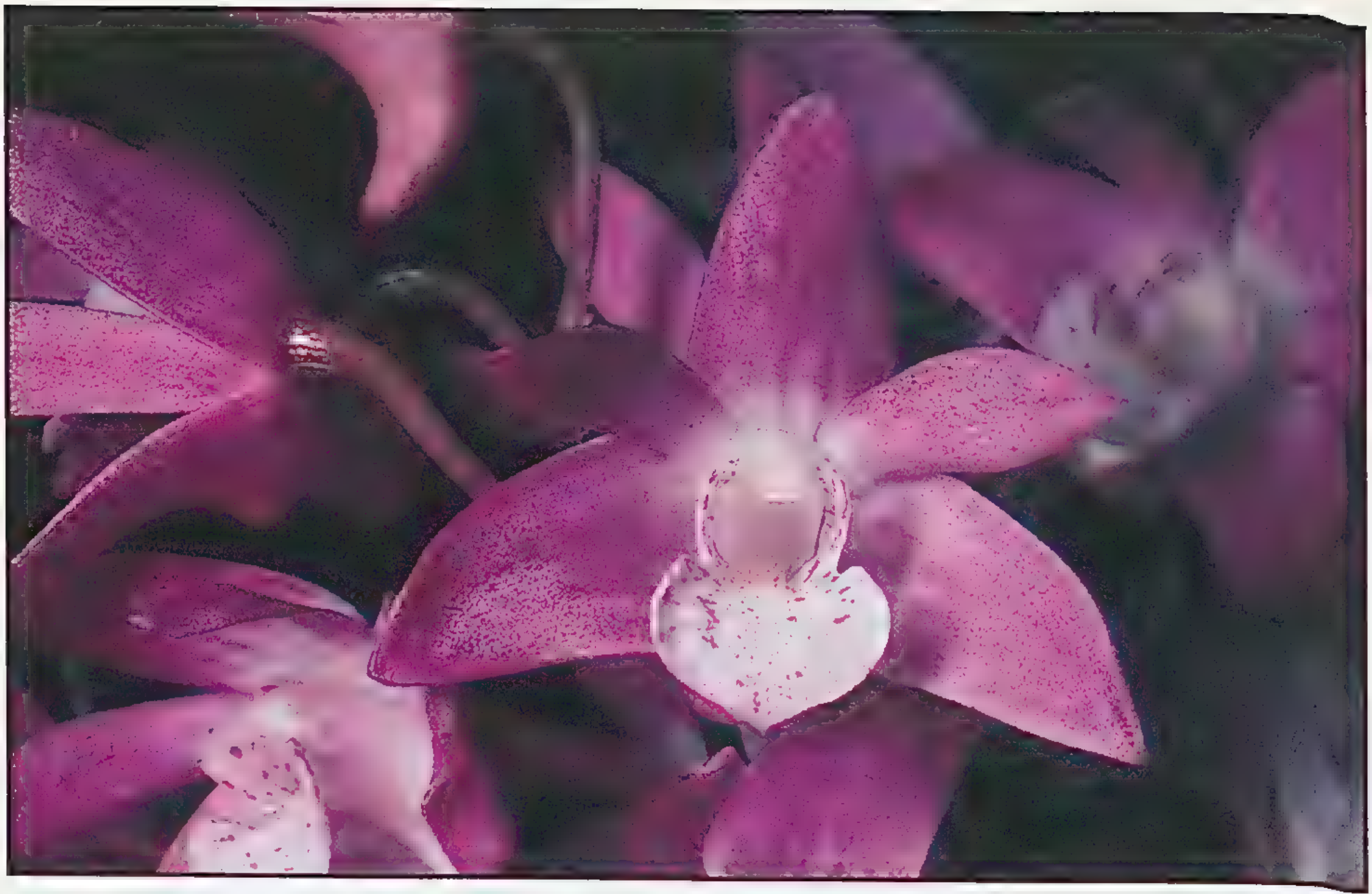

Plate 20: *Dendrobium* Yondi 'Kayena', AM/NSW-ANOS, ACC/ANOS. Photo: D. Titmuss.

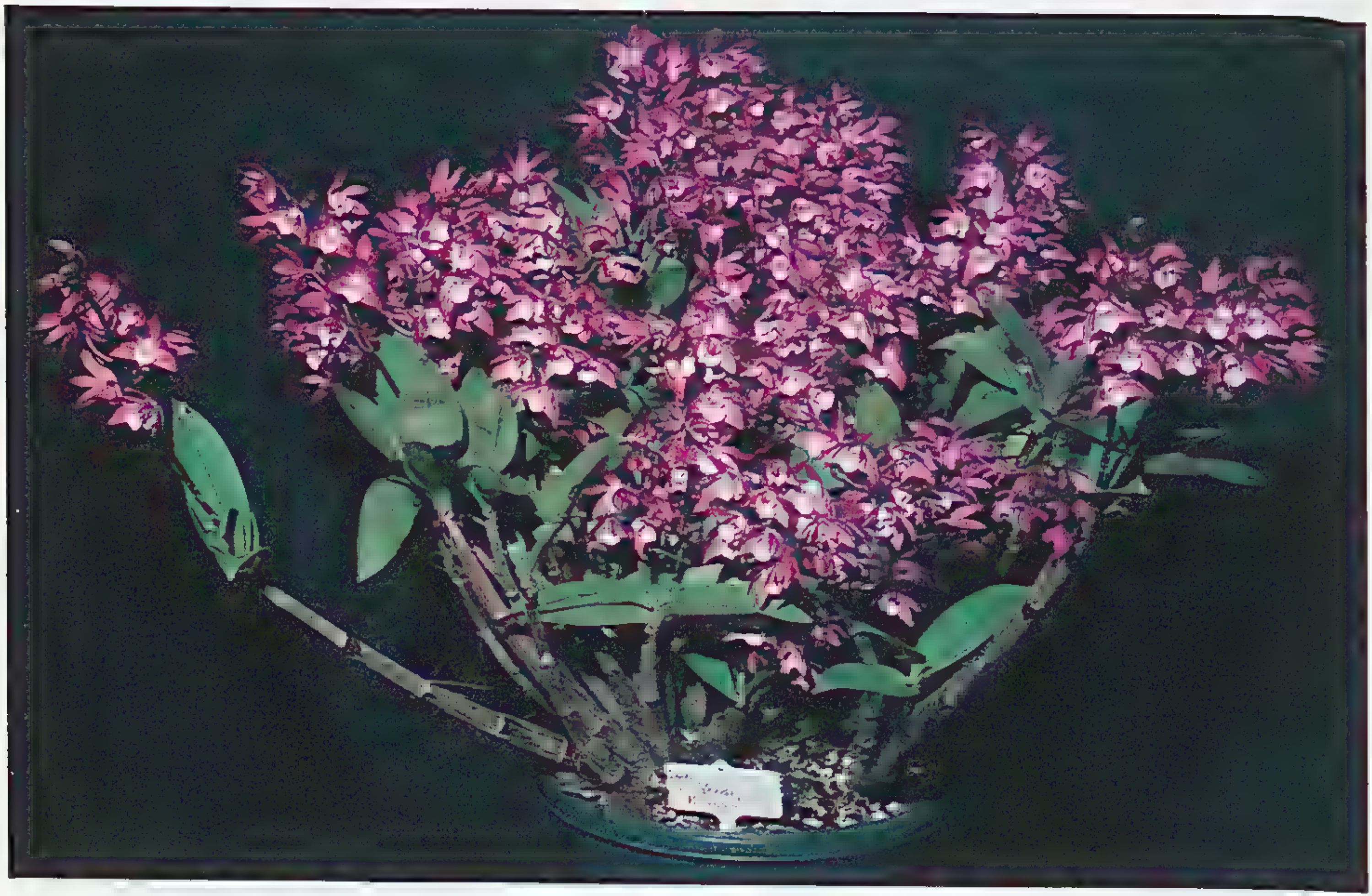

Plate 21: *Dendrobium* Yondi 'Kayena', AM/NSW-ANOS, ACC/ANOS. Photo: D. Titmuss.

VALE — DR ANDREÉ MILLAR, O.B.E.

Ron Kerr

As A.N.O.S. Council Secretary 1990–91 Andreé Millar was one of those who worked very hard for the success of the First International Australasian Native Orchid Conference held at Wollongong. The stress of that work and the rigours of the uncertain New South Wales climate, after years in the tropics, caused her to move to warmer Brisbane.

She was a firm believer in A.N.O.S. and the Australian Orchid Council as national bodies which could do more for Australian growers than scattered weak groups acting alone. For this reason she strongly supported *The Orchadian* and *Orchids Australia,* claiming that, as grower-owned bodies, they could do for Australia what the *American Orchid Society Bulletin* has done for American growers.

From Brisbane she visited other states and wrote for *Orchids Australia* about the people, the societies, nursery folk and their breeding lines. She showed a detailed knowledge of Australian and Papua New Guinea species and hybrids and was thrilled by the emergence of a promising export business in tropical orchid flowers from Darwin.

Andreé started growing orchids at Bulolo, Papua New Guinea, where her husband was a mining engineer. Bulolo was even richer in orchids than it was in gold. Soon the Millars had the biggest collection of orchids on the island; and the world, first in the person of Hermon Slade, beat a path to their bushhouse door.

When Bulolo declined the Millars moved to Lae. The collection became the basis for the new Lae Botanic Garden cultivars and Andreé joined the Herbarium staff. Overseas biologists started arriving in PNG as post-war interest in the island grew. Andreé's job included looking after them, arranging carriers and guides and accompanying them. She was particularly influenced by Professor Holttum during a month long trip with him. The thoroughness and honesty of his work proved examples she sought to follow. He taught her to find and appreciate the minute jungle gems others overlook.

On botanical patrols covering the islands, foreshores, rivers and highlands, she roughed it through more of Papua New Guinea than any other woman has ever done — and few men.

When the Government bought "Kip" McKillop's plantation, "Arawa", as site for a base town in support of the new Bougainville copper mine she supervised the transferring of Kip's vast collection of 50,000 orchids and foliage plants to Lae. She found the breaking up of this magnificent collection to be emotionally disturbing.

In 1971 Andreé was appointed curator for the new university teacher garden. Port Moresby was a dry area and she gave priority to planting canopy trees and associated plants to established a jungle area. This is now a real jungle area and some local people claim it has attracted more rain to Port Moresby.

In 1975 the gardens were officially named the National Capital Botanic Gardens. Andreé was awarded the O.B.E. and the title Director. Over the years she has received medals and awards from Governments, scientific bodies and orchid organisations. Of the latter the Australian Orchid Foundation has granted Andreé its Award of Honour.

She maintained strong ties with botanical institutions worldwide and endeavoured to establish a firm succession against the day she had to retire. After she retired the gardens suffered from political changes and severe funding cuts. With fewer staff and lowered morale and drive the gardens languished.

Fortunately over the past two years the gardens have been brought back to lusty life by a worthy successor to Andreé in Justin Tkatchenko. Funding has been greatly increased.

In her lifetime Andreé became known as "missus bilong pulpul", which translates as "The Lady of Flowers". It is a fitting epitaph. ✾

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AN INTRODUCTION TO THE MAIN NINETEENTH CENTURY CONTRIBUTORS TO OUR BOTANICAL KNOWLEDGE ABOUT AUSTRALIAN ORCHIDS

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As native orchids have become so popular in recent years I thought it might be topical to spare a thought for the main 19th century collectors and botanists on whose work the knowledge of these plants is based. We should not forget that the collections were generally made under the most difficult conditions and often at great personal risk.

Firstly, however, a few words about collectors prior to the nineteenth century. Then, as times of operation of the remainder often overlapped, an alphabetical order will be followed. Also, it was my intention to give an account of operators right across the continent but as time for talks here is rationed, the only way in which a meaningful account could be given seemed to be to divide the workers into regions of operation, starting with general, followed by Queensland, then, as time permits, follow with New South Wales, Victoria, Tasmania, South Australia, Northern Territory and Western Australia.

Willam Dampier who called at several places along the western coast of Australia in 1688 and 1699, collected some botanical specimens, apparently the first from Australia and apparently no orchids were collected; evidently they were not worked on prior to William Baxter, curator of the Oxford Botanical Gardens 1813-1851.

As far as can be ascertained, the first introduction to Australian orchids was by Joseph Banks and Daniel Solander who accompanied James Cook on his first expedition which landed at Botany Bay, New South Wales, in 1770, then on the Queensland coast at Bustard Bay, Thirsty Sound, Hinchinbrook Island, Endeavour River, Point Lookout and Lizard Island. However, little botanising was done in places other than Botany Bay and Endeavour River. Three illustrators, Sidney Parkinson, Diedrich Spöring and Alexander Buchan, accompanied the expedition and of course some orchids featured in their work. Seeds of many plants were collected on the expedition and introduced to cultivation in England and later some of these were illustrated in various works on botany. However, it is highly unlikely that any orchids were grown from seed.

Governor Phillip, who established the penal settlements at Port Jackson in 1788, was accompanied by John White as surgeon-general to the settlement. White sent specimens and illustrations back to England and from these James Edward Smith was able to write his "Specimen of the Botany of New Holland" (1793) and "Exotic Botany" (1804) in which *Dendrobium speciosum* and three species of *Diuris*, including the beautiful *D. punctatum* and one of *Caladenia*, were described and illustrated and *Dendrobium linguiforme*, which was our first dendrobe described (by the German Olof Peter Swartz in 1800) figured.

Cook, on his third voyage, 1776-80, called at Adventure Bay, Tasmania, in January, 1777 and there David Nelson and William Anderson collected specimens which passed into the Banks Herbarium. However as far as I can ascertain none of their orchids, if any were collected, were illustrated.

Archibald Menzies, who was surgeon and naturalist with Vancouver when he called at King George's Sound, W.A. in 1791, collected quite a lot of specimens and these also came into the hands of Banks.

"GENERAL" WORKERS

Backhouse, James (1794–1869)

A nurseryman who botanised in Yorkshire, became a missionary for the "Society of Friends" in Norway and the Southern Hemisphere, including Australia, where he collected botanical specimens from every state. He was a correspondent of J. E. Smith and W. J. Hooker and was the author of "A Narrative of a Visit to the Australian Colonies" (London 1843). There is also a MS. volume at Kew labelled "Backhouse, James, Botany of New South Wales". Almost certainly there would be some references to orchids.

Banks, Joseph (1743–1820)

Born at London 13/2/1743, died near the same city 13/6/1820. He was the only son of William Banks of Revesby, Lincolnshire, who bequeathed his immense fortune to Joseph. Joseph was educated at Christchurch, Oxford, D.C.L. 1771, baronet 1781, K.B. 1795, Privy Councillor 1797, President of the Royal Society from 1778 till his death. He is reputed to have been a personal friend of the reigning monarch, King George IV. He was with James Cook on his circumnavigation of the world (1768–1771) during which New South Wales was discovered. Banks maintained a scientific and art section on the "Endeavour", Daniel Solander being the principal member of it. He made large collections at New South Wales (Botany Bay and Endeavour River) which formed the basis for a fine illustrated work issued by the trustees of the British Museum about the turn into the present century. The only orchids listed are:–

Dendrobium undulatum R.Br. (= *D. discolor* Lindley) — Bustard Bay, Bay of Inlets, Cape Grafton, Endeavour River
Dendrobium canaliculatum R.Br. — Endeavour River
Dendrobium rigidum R.Br. — Endeavour River
Prasophyllum striatum R.Br. — Botany Bay
Pterostylis revoluta R.Br. — Botany Bay

Banks had the oversight of the Royal Botanic Gardens at Kew and as the president of the Royal Society, was the arbiter of science in Britain for many years. He sent botanical collectors to various parts of the world (including Robert Brown to Australia) and received their seeds and collections of plants for Kew and dried specimens for his own herbarium, which, together with his library, was the most celebrated botanical institution of the time. His botanist-librarians were, successively, Solander, Dryander and Robert Brown (who survived him). He was the patron of the Bauers and other botanical artists. His herbarium is now in the British Museum. He always identified himself with Australian interests.

Bentham, George (1800–1884)

Born at Stoke near Portsmouth and died at London. He was one of the leading British botanists of all time and has an enormous amount of work, particularly systematics, to his credit, especially his "*Genera Plantarum*" and "*Flora Australiensis*", with which latter work he was greatly assisted by specimens and notes from Ferdinand Mueller. Vol. 6 (1873) contains 129 pages devoted to orchids, but he did not describe many Australian species. He is commemorated by nine Australian plants, two of them orchids:–

Microtis benthamiana Reichb.f. = *M. parviflora* R.Br. and *Thelymitra benthamiana* Reichb.f.

Brown, Robert (1773–1858)

Born in Montrose, Scotland and died in London. He was trained in medicine (though failed to take a degree), but was a keen naturalist who impressed Banks and was employed as a naturalist, on a salary of £420 a year, along with Ferdinand Bauer as botanical draughtsman at a salary of £315, to accompany Matthew Flinders on his circumnavigation of Australia in the "Investigator" in 1801. Brown apparently concentrated on botanical collecting and thousands of specimens, including many orchids, were collected from various places right around the coast and some of these were beautifully illustrated by Bauer. From these specimens, notes prepared on the long voyage home in 1805 and his freely given access to the Banks Herbarium, Brown was able to prepare the first comprehensive work on Australian flora, "*Prodromus Florae Novae Hollandiae et Insulae Van Diemen*". This (250 copies) was published in 1810 at the sole expense, £19/14/4½, of Robert Brown who was bitterly disappointed at the sale of only 26 copies, at a price of 18/–. This is understandable when one realises that the whole work is in Latin and unaccompanied by any illustrations. It is, nevertheless, a monumental work, esteemed throughout botanical circles (Brown presented copies to leading botanists throughout the world) and his section on orchids, wherein numerous new species were described, forms the basis of our knowledge of Australian orchids.

Bauer's companion work "*Illustrationes Florae Novae Hollandiae*" (1813) was equally disappointing in its sales and both gents decided not to continue with further volumes of their work. Bauer's work contains a beautiful illustration of Brown's *Pterostylis grandiflora*. Robert Brown is commemorated by four Australian orchids:–

Acianthus brownii F.Muell. = *A. fornicatus* R.Br. pro parte and *A. exsertus* R.Br. pro parte
Glossodia brunonis Endl. = *Elythranthera brunonis* (Endl.) A. S. George
Microtis brownii Reichb.f. = *M. rara* R.Br.
Prasophyllum brownii Reichb.f.

Bauer is commemorated by *Genoplesium baueri* R.Br.

Cunningham, Allan (1791–1838)

Born at Wimbledon, near London, in 1791. Both he and his brother Richard (who was killed by aborigines on Mitchell's expedition) were assistants to William Aiton, Director of the Royal Botanic Gardens, Kew; Aiton recommended Allan to Sir Joseph Banks who sent him on an expedition to Brazil where he spent two years (1814–16). Soon after his return to England he was sent on a similar mission to Australia. After five years he returned to England in 1831 and settled down at Kew to study his collections, notably those from north-western Australia. When Charles Frazer died, the position of Colonial Botanist at Sydney was offered to Allan who declined recommending his brother Richard for the position which he accepted but was killed in 1835. Allan was again approached and this time he accepted, arriving in Sydney in February, 1837. He quickly suggested that he be appointed Government Botanist and made considerable demands which were not acceptable to the government. Accordingly he travelled to New Zealand but returned to Sydney six months later in poor health and died in 1838. He accompanied many expeditions to remote (at the time) areas of New South Wales, Queensland, Northern Territory and north-western Western Australia, collecting and recording on all these expeditions. He described only a few Australian orchids, notably *Dendrobium tetragonum* and *D. pugioniforme,* but gave specimens to Lindley and others to describe.

Endlicher, Stephen Ladislaus (1804–1849)

Born at Pressburg, Hungary, died at Vienna. He was Professor of Botany at the university, 1840 and Director of the Botanic Gardens and Botanic Museum, Vienna. He was the author of a number of standard works, including *"Genera Plantarum"* in which there are descriptions of many Australian genera. He also described several species of Australian orchid. He is commemorated in 13 Australian plants, none orchids.

FitzGerald, Robert David (1830–1892)

All the workers so far mentioned were general botanists, orchids occupying only a small part of their interest and time. The main interest of Robert David FitzGerald, however, was Australian orchids. He was born in Tralee, County Kerry, Ireland, on 30/11/1830, son of a banker of the same name who became bankrupt trying, from his own resources, to offset the losses of local farmers during the Irish potato famine. The younger Robert, from early childhood, showed a keen interest in birds and plants and from a very tender age showed considerable skill as an artist. After studying civil engineering he emigrated to Sydney in 1856, where he was appointed by the Lands Department of New South Wales to the position of "qualified civil engineer", a position he held for 35 years before being promoted to "deputy surveyor-general", which position he held until his death in Sydney in 1892.

His positions allowed him the opportunity to travel extensively in Australia and considerable scope for the study and illustration of orchids, his interest in which had grown from the reading of Charles Darwin's work on them and was sparked by seeing, in full bloom, large clumps of the "rock lily" (*D. speciosum* Smith) growing on rocks on the shores of Myall Lakes and Port Stephens. He came under the notice of the government botanist, Charles Moore, who invited FitzGerald to accompany him to Lord Howe Island to study the flora of that island. His work gained considerable acclaim as the flora there had been very imperfectly known. In 1876 he commenced the publication in parts, of his world-acclaimed work *"Australian Orchids"*, for which he prepared all the illustrations (mainly life-size plant and enlarged details of flower), descriptive text and in many cases, lithography (on stone) as well. He was not able to complete his task before his death but he did complete 302 illustrations, 205 of which were embraced in 12 parts in two volumes, the last part published subsequent to his death. 92 unpublished illustrations are housed in the Mitchell Library in Sydney and five in the Herbarium of New South Wales. It is not an exaggeration to say that his work has never been surpassed, although closely approached by Nicholls in his *"Orchids of Australia"* in 1969.

FitzGerald published descriptions of 58 new species of Australian orchid, 19 of which have proved to be synonyms of earlier published descriptions of other workers (in particular those of J. D. Hooker) and six have since been transferred to other genera. He also wrongly determined a further 19 species. This may sound a lot of errors, but when one considers that the descriptions of earlier workers were rarely accompanied by an illustration and the text very brief (although it may have been adequate at the time of publishing) and also that, as FitzGerald was residing in Australia, he did not have access to type specimens, most of which are housed in English and European herbaria, one marvels at the accuracy of his observations. There have been changes to a total of 42 names used by FitzGerald, mainly by the subsequent erection of new genera, following the lead of contemporary or earlier experts or owing to his lack of awareness of obscure early descriptions.

I am not aware of what purchasing response there was to FitzGerald's work but I am sure that it would have very greatly exceeded that for Brown's and Bauer's works. However, probably because of excessive printing of some parts of the work, some parts or separate sheets were, early this century, presented by the government to various schools throughout N.S.W. As storage space in many of the schools was at a minimum and as the parts presented were incomplete or the schoolmasters of the time did not fully realise the value of their possessions, these works often ended up in rubbish bins. I was fortunate enough about 55 or 60 years ago to be presented with a few such sheets that had been rescued from their fate and I had them bound. A couple of years ago, some more sheets, albeit much the worse for wear, which had been rescued under similar circumstances by a different person very many years ago, were presented to me and very gratefully accepted as you can well imagine.

Incidentally, the facsimile edition of FitzGerald's work, arranged by the Australasian Native Orchid Society with permission from the FitzGerald family and printed by the Lansdowne Press of East Melbourne, Vol. 1 published 1977 and Vol. 2 1979, is an absolutely superb reproduction.

FitzGerald is commemorated by *Sarcochilus fitzgeraldii* F.Muell. which fittingly, is one of Australia's most beautiful orchids.

La Billardière, Jacques-Julien Houtou de (1755–1834)

Accompanied the 1801-02 French expedition by d'Entrecasteaux to Esperance Bay in south-west Western Australia, South Australia (mainly Kangaroo Island) and Tasmania and collected specimens, including orchids, at these localities. The expedition became torn by divided loyalties owing to the French revolution and the specimens were transferred to a Dutch ship later captured by the British and the specimens were passed to Banks. This gentleman was intensely curious, but motivated by a greater sense of honour, refrained from even examining the specimens and they were sent to Paris and de La Billardière, who was extremely grateful. In his "*Novae Hollandiae* plantarum specimen" (1804-7), he described some new species from this collection.

Lindley, John (1790–1863) Ph.D., F.R.S., F.L.S.

Born at Gatton, near Norwich, England, died at Turnham Green, London. He was the son of a nurseryman from whom he gained a great interest in plants. He was educated at the Norwich Grammar School, became assistant Librarian to Banks, assistant secretary of the Royal Horticultural Society and the first professor of botany at the London University. It was on his recommendation that Kew Gardens were acquired for the nation. He was notorious for his keen powers of observation and interpretation of minute details of structure and functions of plants, in fact he was referred to as "the lynx-eyed Lindley" by Reichenbach. He published many works and described (but not illustrated) 45 Australian orchids, mostly in "*The Genera and Species of Orchidaceous Plants*" (1830-40), an appendix to the "*Botanical Register*" under the title of "A Sketch of the Vegetation of the Swan River Colony" (1839), based mainly on Drummond's collections, also as articles to the journals "*Edwards's Botanical Register*", "*The Gardeners' Chronicle*" (which is still being published) and "*Paxton's Flower Garden*". He also named the plants collected on Mitchell's third journey. He is commemorated by the names of about 22 Australian plants including the orchid *Eriochilus lindleyi* Endl. = *E. scaber* Lindley.

Miquel, Frederick Anton Wilhelm (? – ?)

A Dutch botanist who specialised in some families of Australian plants. His involvement in Australian orchids was not great, seemingly restricted to the altered naming of a couple of exotic species which have an extended range to Australia. He is commemorated by the names of a few Australian plants, none orchids.

Mitchell, Thomas Livingstone (1792–1855)

Born Craigend, Stirlingshire, Scotland and died at Darling Point, Sydney 5/2/1855. He served throughout the Peninsular Wars where he attained the rank of major, later Sir Thomas. He came to the post of Surveyor General of New South Wales in 1827, at a time when squatting was rife and he was required to do a great deal of surveying of roads and bridges and exploratory work in New South Wales, South Australia and Queensland. During his extensive journeys he was very fond of natural history, especially plants, Lindley describing 77 of these. He is commemorated by 24 plants, including *Pterostylis mitchellii* Lindley.

Mueller, Ferdinand Jakob Heinrich (1825–1896)

Born at Rostock, Germany and died at Melbourne. He arrived in Australia in 1847 and began working as a pharmaceutical chemist in Adelaide. He set about diligently botanising around Adelaide and corresponded with botanists in England and Europe. Sir Joseph Hooker who was director of the Kew Botanic Gardens at the time was so impressed by Mueller that he recommended him for the position of Government Botanist of Victoria, a position he ably fulfilled from 1852 till his death. In addition he held the position of Director of the Botanic Gardens, Melbourne, until 1873. There has been considerable controversy over his appointment and subsequent retirement from the position of Director of the Gardens, but there can be no doubt that he amassed a magnificent collection of Australian and exotic plants and herbarium specimens for the Gardens and gained worldwide recognition as one of the leading botanists of the times. He was also a keen geographer and did exploratory work (and collecting) in Victoria, Tasmania, Northern Territory and Western Australia. He also assisted some other explorers and helped to raise funds to assist explorations in New Guinea and Antarctica. He was a prolific writer and described numerous plants, including about 70 species of Australian orchids which were published mainly in parts of his *"Fragmenta Phytographiae Australiae"* but some in "The Australian Chemist and Druggist" and "The Southern Science Record". He also assisted George Bentham in the preparation of his *"Flora Australiensis"*. Mueller was showered with honours, both scientific and political, being made an hereditary baron in 1871 by the King of Wurtemburg, K.C.M.G. in 1878 and receiving the Royal Medal of the Royal Society of England in 1888. He is commemorated by many Australian plants, including *Taeniophyllum muelleri* Benth.

Reichenbach, Professor Heinrich Gustav (1823–1889)

Born in Leipzig and later became Professor and Director of the Botanic Gardens at Hamburg and for a while at Kew. He was a worthy successor to Lindley as the world's leading orchidologist of his time. Orchids from practically every country of the world passed through his hands and he was responsible for describing about 15 Australian species and changes to the names of many others. He was an accomplished artist in both colour and black and white.

Smith, James Edward (1759–1828)

Born at Norwich 2/12/1759, died Norwich 17/3/1828. He gained a M.D. degree at Leyden 1786 and F.R.S. 1785. He was the founder of the Linnean Society, purchased collections in 1784 and was knighted in 1814. He described a large number of Australian plants, including five species of orchid sent to him by John White (referred to earlier). He is commemorated by seven Australian plants, including one orchid, *Macdonaldia smithiana* Gunn ex Lindley = *Thelymitra smithiana* (Gunn ex Lindley) Hook.f. = *T. flexuosa* Endl.

Solander, Daniel Carl (1733–1782)

Born at Pitea, Sweden, 12/2/1733, died London 16/5/1782. He was a pupil of Linnaeus and came to England in 1759. He was offered the post of Professor of Botany at St Petersburg in 1762 but declined. He was appointed assistant in the British Museum in 1765 and shortly afterwards gained employment with Joseph Banks and accompanied him with Cook when he went on the voyage of the "Endeavour" in 1768–1771, during which cruise New South Wales was discovered, assisting Banks with his collecting (including orchids) and tabulating. On returning to England he lived in Banks' house as botanist-librarian until his death. He was a naturalist who specialised in botany and described many Australian plants, but no orchids and his published works fall short of what one would expect from such a talented botanist. He is commemorated by five Australian plants, none orchids.

QUEENSLAND

Armit, William E. de M. (? –1901)

Was sub-inspector of the Queensland mounted police 1872-83 before going to New Guinea. He collected largely in North Queensland for Mueller, e.g. on the Lynd, Herbert, Gilbert and the head of the Burdekin. He is commemorated by *Sarcochilus armitii* F.Muell. = *Saccolabiopsis armitii* (F.Muell.) Dockr.

Bailey, Frederick Manson (1827–1915)

Born at Hackney near London and died at Brisbane. His father John was a nurseryman associated with the famous nursery of Loddiges. The Baileys emigrated to South Australia in 1839 where John was appointed Government Botanist and formed the first botanic gardens on the Torrens River. Although the position was created, available funds for salary and works were apparently so meagre that John felt forced to retire and started farming and nursery work at Adelaide. Frederick stayed with his father in business for some years but then joined the Victorian gold rush. He did not stay in Victoria for very long before going to New Zealand where he was engaged in general agriculture and fruit growing until 1861 when he came to Queensland. He established a seed and nursery business in Brisbane before being appointed in 1875, to the position of botanist by the government, to do research on the diseases of livestock and plants of the state. In 1881 he was appointed Colonial Botanist, a position he held until his death. He was a prolific writer on Queensland botany, his main interest being ferns, but he described a number of Queensland orchids and 78 pages of Vol. 6 (1902) of his "*Queensland Flora*" gave a complete coverage of the orchids of the state. He is commemorated by many plants, including *Bulbophyllum baileyi* F.Muell.

Bancroft, Dr Joseph (1836–1894) — A medical man (M.R.C.S., M.D.)

Born near Manchester, England, 21/2/1836, died at Brisbane 16/6/1894. He worked mainly on the pharmacology of some Queensland plants and also worked on hybridising of food plants. He is commemorated by *Dendrobium speciosum* Smith var. *bancroftianum* (Reichb.f.) = *D. speciosum* Smith var. *hillii* Masters forma *bancroftianum* (Reichb.f.) Bailey = *D. Xgracillimum* (Rupp) Leaney.

Bernays, Lewis Adolphus (1831–1908)

Born in London, died in Brisbane. He was the son of a professor of the German language. He became Clerk of the Legislative Assembly of Queensland in 1859, was the first honorary secretary of the Queensland Acclimatisation Society and was a member of the Linnean Society of London and Royal Society of Queensland. He was an assiduous collector of native plants and interested in the introduction of economic plants. He is commemorated by *Phaius bernaysii* Rowland ex Reichb.f.

Bidwill, John Carne (1815–1853)

Born Exeter, East End, died at Tinana, Wide Bay 16/3/1853. He travelled and botanised in New Zealand and became the first Director of the Botanic Gardens, Sydney (all his predecessors were entitled "superintendent") on 1/9/1847. He was appointed by the Governor but owing to the crossing of some letters, the secretary of the state appointed Charles Moore and accordingly Bidwill vacated his job on Moore's arrival in January, 1848. On leaving the botanic gardens he was appointed Commissioner of Crown Lands at Wide Bay. He made botanical observations in and collections from this area and his herbarium went to Kew. He is commemorated by 11 Australian plants including the famous Bunya Pine (*Araucaria bidwillii* Hooker f.) and he described one orchid, the popular *Dendrobium kingianum* Bidw. ex Lindley: named after his friend Captain P. P. King.

Bowman, Edward Macarthur (1826–1872)

Born Sydney, died Clermont, Peak Downs, Queensland. He was the son of Dr James Bowman Colonial Surgeon for Sydney for some years. He owed his botanical training to his uncle, Sir William Macarthur of Camden. Most of his time was spent on Queensland stations where he collected for Mueller and others, many passing to Bentham who was extremely grateful. He is commemorated by *D. bowmanii* Benth. (which species was, for many years, erroneously known as *D. mortii*).

Carron, William (1823–1876)

Born Norfolk, England 18/12/1823, died Grafton, N.S.W. 25/2/1876. He arrived in Sydney in charge of plants for one of the Macleays. He was botanist to the expedition of Edmund D. Kennedy which left Sydney on 29/4/1848 on the barque "Tam-O'-Shanter" to explore the country between Rockingham Bay and Cape York. On its return Carron and Jacky Jacky were the only survivors. He was "collector" for the Sydney Botanic Gardens 1866–1875. His main botanical interest seem to have been in timbers. He is commemorated by four Australian plants, two of them orchids: *Phaius carronii* F.Muell. = *Phaius tancarvilleae* (Banks in L'Herit.) Blume and *Dendrobium carronii* Lavarack.

Dallachy, John (1808?–1871)

Was born in the north of Scotland about 1808. As a young man he was employed as a gardener at Haddo House, the Earl of Aberdeen's place, which was sometimes visited by Sir William Hooker. On one of these visits Dallachy applied to Hooker to be employed at Kew and the request was granted. In a few years he returned as head gardener to Haddo House, the grounds of which at that time were the finest and most extensive in Scotland and the Earl, an enthusiastic botanist, encouraged the cultivation of New Holland Plants.

Dallachy left Scotland in 1847 to fill an appointment as manager of a coffee plantation in Sri Lanka, bearing a letter of introduction from the Earl of Aberdeen to the governor of Ceylon (as Sri Lanka was then called). However, when gold was discovered in Victoria, Dallachy approached the governor of Ceylon to give him a letter of introduction to Governor Latrobe of Victoria who, on the death of Mr Arthur, appointed Dallachy the Superintendent of the Melbourne Botanic Gardens, the title being changed to Curator.

He made frequent botanical expeditions in Victoria and made the acquaintance of Mueller and introduced him to Governor Latrobe, recommending Mueller as a suitable person to be appointed Plant Collector and Botanist. For various reasons (with which I am unfamiliar) Dallachy lost his position in the gardens and went as a plant collector in Victoria and Queensland while Mueller, in 1857, succeeded him in charge of the gardens. Dallachy was one of the best, if not the best collector every employed by the Melbourne botanic Gardens and was never given the justice he deserved.

On leaving the gardens he started a nursery at Mt Erica (now East Prahran) but failed to make a success of it. Eventually he left Victoria (date unknown) for Queensland, never to return to Victoria again. He died in his tent near Rockingham Bay, Queensland, 4/6/1871.

Dallachy discovered a large number of new species, including orchids, especially in the vicinity of Rockingham Bay, most of which went to the hands of Mueller who passed on many to Bentham. Dallachy is commemorated by the names of many plants, especially rainforest plants and by two orchids, *Bulbophyllum exiguum* F.Muell. var. *dallachyi* Benth = *B. newportii* (Bailey) Rolfe and *Pogonia dallachyana* (Benth.) = *Nervilia dallachyana* (Benth.) Schltr. = *N. plicata* (Andr.) Schltr.

Fitzalan, Eugene (1830–1911)
Was botanist-collector in Lieutenant Smith's expedition to the mouth of the Burdekin in 1860. He collected many plants, including orchids, which were sent to Mueller. He is commemorated by *Eulophia fitzalanii* Benth. = *E. bicallosa* (D.Don) P. Hunt and Summerh.

Hartmann, C. H. (1833–1887)
Collected herbarium specimens in south Queensland for many years, many of the specimens being determined by F. M. Bailey and Mueller. He is commemorated by *Sarcochilus hartmannii* F.Muell.

Hill, Walter (1820–1904)
Born at Scotsdyke, Scotland, died Eight Mile Plains, Brisbane. He was trained as a gardener, spent two years at the Edinburgh Botanic Gardens and nine years at Kew. He came to Sydney in 1852 and went to the Victorian goldfields. He entered into a partnership with Frederick Strange for the purpose of collecting natural history specimens and was with Strange when he was speared by aborigines on Percy Island. He was appointed the first superintendent of the Brisbane Botanic Gardens in 1855 and also appointed Colonial Botanist. He was very interested in the introduction of economic plants. In 1879 he went on an expedition in company with G. E. Dalrymple, to explore the north-east coast. He took with him seeds, etc., of many economic plants which he planted at ports of call and islands. He, with a party, ascended Mt Bellenden Ker in November, 1873. He did not write much but did describe *Dendrobium nindii* W.Hill and is commemorated by *D. hillii* F.Muell. = *Sarcochilus hillii* (F.Muell.) F.Muell., and *Saccolabium hillii* F.Muell. = *Peristeranthus hillii* (F.Muell.) Hunt.

Kefford, W. R. (? – ?)
Collected plants on the Johnstone River about 1800–?. He is commemorated by *Cleisostoma keffordii* Bailey = *Camarotis keffordii* (Bailey) J.J.Smith = *Micropera fasciculata* (Lindley) Garay.

Leichhardt, Friedrich Wilhelm Ludwig (1813–1848)
Born at Trebatsch, near Beeskow, Prussia 23/10/1813 lost in Australia 1848. He received some academic education in natural sciences but never obtained a degree. He arrived in Sydney in 1842, his fare having been paid by an English friend. During the next two years he travelled alone in the Sydney area and made an overland trip to Brisbane. He also gave botanical lectures in Sydney. On his journeys he collected many plants and rocks and planned a herbarium for New South Wales. Unable to obtain government support, he persuaded several wealthy colonists to finance an expedition from Darling Downs to Port Essington in Northern Territory, a journey of 4,800km, which began in October, 1844

and took 15 months to complete. When he returned he received a government grant of £1,000 plus £1,500 as an appreciation. In 1846 he planned another expedition with several assistants to cross Australia from Darling Downs to Perth, but rain and the flooded Condamine so slowed their progress that they returned to base. In 1848, together with six other men he left on a mission with a similar destination but, after leaving the last pastoral property on the western side of the Condamine on the third of April they were never seen again. Leichhardt's considerable collection obtained in N.S.W. and on his first expedition was presented to the Sydney Museum by his friend and executor, Mr Lynd. At Mueller's request, some years later, the collection was sent on loan to Melbourne for investigation but very few of the specimens were returned and these were handed to the newly founded Sydney herbarium which had been a vision of Leichhardt. I am unaware of the orchid content of Leichhardt's collections but surely there would have been some. He is commemorated by about 20 Australian plants, none of which are orchids.

MacGillivray, John (1821–1867)

Was the son of William, professor of botany at Aberdeen and died in Sydney. He was naturalist on H.M.S. "Rattlesnake", collected extensively in north-eastern New South Wales, Queensland and many islands. He also accompanied Captain Denham in H.M.S. "Herald" on their island mission. MacGillivray's herbarium, containing several hundred species (no doubt including some orchids) in excellent condition was given to Sir W. Hooker.

Schneider, H. (? – ?)

He collected plants for many years in south Queenland, many of them going to the Queensland Botanist. His wife who apparently was also a keen collector, is commemorated by *Dendrobium schneiderae* Bailey.

Stuart, J. W. R. (? – ?)

In 1884 he collected orchids in the scrubs between Mourilyan Harbour and Herberton and discovered many new species. He is commemorated by *D. stuartii* Bailey (1884), the author stating "cult. Brisbane Botanic Gardens ex Herberton". The plant or part thereof was sent to FitzGerald by Bailey and was figured in Australian Orchids 2(3):[t.6] 1888. However, it is highly unlikely that the plant was either collected by Stuart or came from Herberton as this species, in Australia, is confined to the northern part of Cape York Peninsula.

You may be wondering why I have made no mention of the Macpherson in *Pomatocalpa macphersonii* (F.Muell.) Hunt. Actually the type specimen was collected by Dallachy near Rockingham Bay and named for some undisclosed reason but probably diplomatic, *Saccolabium macphersonii* by Mueller in commemoration of John Alexander MacPherson, a prominent Victorian politican of the time but I can find no reference to his having any botanical or orchid interests.

NEW SOUTH WALES

In addition to Bidwill, Carron, Cunningham, FitzGerald and Leichhardt already spoken about, we have the following:–

Beckler, Herman (? – ?)

A native of Germany, he was a medical officer and botanist to the Burke and Wills expedition. He collected near the Darling River and rivers of north-eastern New South Wales. He is commemorated by a number of Australian plants including two orchids, *Cleisostoma beckleri* (F.Muell. ex Benth.) = *Sarcochilus beckleri* (F.Muell. ex Benth.) F.Muell. = *Sarcanthus beckleri* (F.Muell. ex Benth.) Rupp = *Papillilabium beckleri* (F.Muell. ex Benth.) Dockr.; and *Dendrobium beckleri* F.Muell. = *D. schoeninum* Lindley.

Daintrey, Edwin (1814–1887)

Born at Petworth, Sussex, England, 2/9/1814, died Randwick, Sydney 3/10/1887. Studied medicine but in his fourth year ill health obliged him to give it up. He then entered a solicitors office and admitted as a solicitor in England. Coming to New South Wales in the early 1840's he settled in Sydney where he practised his profession. He had cultivated literary tastes, was interested in the Sydney Zoological Gardens, was a founder of the Linnean Society of N.S.W. and was considered an excellent botanist. He is commemorated by two Australian plants including one orchid, *Pterostylis daintreyana* Benth.

Deane, Henry (? – ?)

An amateur botanist and friend of William Woolls. Was a railway engineer with the N.S.W. Railway and later engineer in chief of the Commonwealth Railways, supervising, amongst other things, the Transcontinental Railway.

He is commemorated by *Prasophyllum deaneanum* Fitz. = *Genoplesium baueri* R.Br.

Moore, Charles (1820–1905)

Born 10/5/1820 at Dundee, Scotland, died Sydney 30/4/1905. On the recommendation of Prof. Hanslow he was appointed Director of the Sydney Botanic Gardens by the Secretary of State (Bidwill had been appointed to the same position by the Governor of N.S.W. but stepped down for Moore) and arrived in Sydney 14/1/1848 and remained as the director until 5/5/1896. He was a member of The Royal Society of N.S.W. for 49 years, serving at times as president, vice-president, councillor and contributed several papers to their journal. He also wrote "Lord Howe's Island; Sketch of the Vegetation, etc.", Sydney, 1869; "A Census of the Plants of New South Wales", Sydney, 1884; "*Handbook of the Flora of New South Wales*", assisted by E. Betche, Sydney, 1893 (in which orchids are treated, some identified by FitzGerald); "Catalogue of the Plants in the Government Botanic Gardens, Sydney", Sydney, 1895 and a few other works of no concern here. He visited New Zealand, New Hebrides and New Caledonia. He is commemorated by about 25 Australian plants including the Lord Howe Island *Dendrobium moorei* F.Muell.

Norton James (1824–1906)

Born Sydney 5/12/1824, died Sydney 18/7/1906. He wrote very little but took a lively interest in the flora of New South Wales cultivating many species. He was chairman of Trustees of the Public Library, Member of the Legislative Council, one of the founders of the Linnean Society of N.S.W. and for many years its honorary secretary. He is commemorated by the orchid *Adenochilus nortonii* Fitzg.

Paterson, William (1755–1810)

Born Montrose(?), Scotland, died on a voyage from Australia 21/6/1810. He was a colonel, F.R.S. 1798, etc. and Lieutenant Governor of New South Wales 1800–1810. He collected in South Africa and Australia, the seeds and plants going to Banks and his herbarium specimens are now in the British Museum. He was for a considerable time Lieutenant Governor of Port Dalrymple (Launceston), Tasmania, when he collected and made botanical observations. The Paterson River in N.S.W. is named after him. He is commemorated by seven Australian plants including the Tasmanian orchid, *Caladenia patersonii* R.Br.

Shepherd, Thomas William (1824–1884)

Born at Hackney, near London 11/3/1824, died Ashfield, Sydney 27/8/1884. He was proprietor of the Darling Nursery at Darlington, Sydney and editor of the "Town and Country" journal of Sydney. He also contributed to the "Sydney Magazine of Science and Art" articles on native plants and the pastoral, agricultural and horticultural resources of Australia. He collected many New South Wales plants, mainly from the Illawarra, some of which went to Woolls and Mueller. He is commemorated by the orchid *Dendrobium shepherdii* F.Muell. = *Bulbophyllum shepherdii* (F.Muell.) F.Muell.

Woolls, William (1814–1893)

Born at Winchester, England, March, 1814, died Burwood, Sydney, March, 1893. He arrived in Sydney in 1832 and was immediately offered a mastership at the newly founded King's School at Parramatta, at which occupation he stayed for a few years before starting his own private school which was operating for many years. In 1873 he was ordained a clergyman of the Church of England and was appointed Incumbent of Richmond. He was an enthusiastic amateur botanist, friend and admirer of Mueller and other notables and a doctorate of philosophy was conferred on him by Gottingen University in 1871 and he also became a Fellow of the Linnean Society of London. He was a prolific writer of articles (and poems) to papers and journals, mostly on botany, including orchids, topical subjects, etc.

He is commemorated by the genus *Woollsia (Lysinema) Epacridaceae* and six species of plants including the orchids *Prasophyllum woollsii* F.Muell. = *Genioplesium woollsii* (F.Muell.) D.Jones and Clements and *Pterostylis woollsii* FitzG.

VICTORIA

Apart from Dallachy, Mueller and others referred to earlier, two other Victorians have their names associated with our orchids.

Robertson, John George (1803–1862)

Born in Glasgow, Scotland 15/10/1803, died in Scotland, 1862. Was a botanist on an Indian expedition for two years, prior to going to Van Diemen's Land in 1831. He left for Portland Bay, Victoria, in February, 1840. He was engaged on pastoral pursuits for a considerable time and was at one time owner of Wanda Vale Station near Casterton, Victoria and collected many specimens in the area. Governor Latrobe was a guest at Wanda Vale on more than one occasion, he and Robertson having similar botanical interests. He was a regular correspondent of Ronald Gunn and he was in Tasmania for nine years, the last seven of which as manager of Formosa Farm for Mr R. W. Lawrence who was also a keen botanist. Robertson sent his dried specimens to Sir William Hooker but they were acquired just before the foundation of the official Herbarium at Kew and there is no formal record of the extent of the collection. However, William Moody, nephew of Robertson, is reported as saying: "Before my uncle left for the old country I helped him pack 4,000 botanical specimens which he collected at Wanda Vale and elsewhere and which he presented to Kew."

He is commemorated by two Australian plants, one of them the orchid *Calochilus robertsonii* Benth.

Walter, Carl (c.1831–1907)

Born at Mecklenberg, Germany, about 1831, died 11/10/1907. Little is known of his movements but for many years he did a vast amount of collecting in Victoria and south-eastern New South Wales for Mueller, many new species in the collections. He published very little but did publish *Diuris punctata* Smith var. *daltonii* C.Walter at a time when his eyesight was failing and his variety is synonymous with the type variety.

TASMANIA

Apart from Backhouse, Brown, La Billardière and Mueller already referred to, four names are indelibly associated with Tasmanian orchids.

Archer, William (1820–1878)

Born at Launceston, Tasmania, 16/5/1820, died at Fairfield, near Longford, Tasmania, 14/10/1878. He was educated at Longford, afterwards in England where he qualified as an architect, then returned to Tasmania to practise. He was elected to the legislature of Tasmania in 1851 and to the ministry in 1860. On the death of his father he inherited Cheshunt, Deloraine. In 1860 he succeeded Dr Milligan as secretary of the Royal Society of Tasmania. He collected assiduously in the areas surrounding his property and on his visit to England in 1857 he brought with him an excellent collection of herbarium specimens, copious notes and drawings and a fund of accurate information which he passed on to J. D. Hooker. In fact Hooker dedicated his "*Tamanian Flora*" conjointly to Gunn and Archer. Archer is commemorated by nine plants including one orchid, *Prasophyllum archeri* Hook.f. = *Genoplesium archeri* (Hook.f.) D.Jones and Clements.

Gunn, Ronald Campbell (1808–1881)

Born at Cape Town, South Africa, 4/4/1808, died at Launceston 13/3/1881. His father was an army man of eminence and Ronald was noted for a commission to the army but sailed to Tasmania in 1829. In 1830 he was appointed Superintendent of Convicts for North Tasmania, in 1833 the Commissioner of the Peace and in 1836 the Police Magistrate at Circular Head. In 1838 he was appointed the Assistant Police Magistrate of Hobart Town and in 1839 private secretary to Sir John Franklin and clerk of the Executive Legislative Council. In 1841 he resigned these positions to manage the estates of W. E. Lawrence of Formosa and subsequently spent most of his spare time in exploring the unsettled districts and reporting on the flora of Tasmania. He represented the northern districts in the Legislative Council and House of Assembly and was engaged by the government in various exploratory expeditions to investigate the natural produce and resources of the state.

In 1864 he was appointed one of the commissioners for selecting the seat of government for New Zealand. Hooker wrote: Ronald Campbell Gunn Esq., F.R.S., F.L.S., to whose labours the flora of Tasmania is largely indebted, was the friend and companion of the late Mr Lawrence from whom he imbibed his love of botany. Between 1832 and 1850 Mr Gunn collected indefatigably over a great part of Tasmania. He was the greatest Tasmanian botanist of his time. He is commemorated by the name of numerous plants, including two orchids: *Caladenia gunnii* (Lindley) Reichb.f. = *Chiloglottis gunnii* Lindley and *Sarcochilus gunnii* F.Muell. = *S. australis* (Lindley) Reichb.f.

Milligan, Joseph (1807–1883)

Born at Dumfrieshire. In 1829 qualified as a M.R.C.S.E. and in 1830 appointed surgeon to Van Diemen's Land Company's establishment at Surrey Hills. He became Superintendent of Aborigines and in 1843 visited their establishment at Flinders Island, remaining in charge until 1855 and supervised the removal of aborigines from Flinders Island to Oyster Cove in 1848. He was one of the founders of the Royal Society of Tasmania and its secretary 1844-60. He left Tasmania in 1860. His writings were mainly on aborigines, meteorology and zoology. He was employed by the governor, Sir William Denison in making reports and surveys of the numerous coalfields of the island. He was an assiduous observer and collector of Tasmanian plants. He is commemorated by names of nine plants, including one orchid: *Dendrobium milliganii* F.Muell. = *D. striolatum* Reichb.f.

Spicer, M. A., Rev. W.W. (? –1879)

Did a great deal of botanical work in England before coming to Tasmania. Was a member of the Royal Society of Tasmania. He was author of *"Handbook of the Plants of Tasmania"*, (Hobart 1878), returned to England the same year only to die the following year. There is a treatment of orchids in his handbook but I am not aware of what it is like.

SOUTH AUSTRALIA

Some of the better known, already alluded to, botanists such as La Billardière, Mueller, etc., were the main contributors to our early knowledge of the orchids of South Australia. Apart from these there were rather many who botanised in the state but few seem to have orchids to their credit. There are however, two exceptions:–

Behr, Herman H. (1818–1904)

Was a medical man, long resident of South Australia, who collected plants, especially in the fourth and fifth decades of the nineteenth century. Most of his new species were described by Schlechtendahl in parts of *Linnea* and by Mueller, although he did collaborate with Mueller and Miquel on a few occasions and did contribute a paper on South Australia flora to Vol. 20 of *Linnea*. He left for California in 1884 where he continued studying the flora on that side of the world. He is commemorated by about 25 Australian plants, two of them orchids: *Caladenia behrii* Schldl. and *Diuris behrii* Schldl.

Tate, Prof. Ralf (1840–1901)

Born Northumberland, England, died Adelaide 20/9/1901. He did considerable botanical work in Ireland, the Shetland Islands, etc., before coming to Australia in 1875 to the chair of Natural Science at the University of Adelaide. He was a keen collector and lecturer and a prolific writer, contributing papers to scientific journals throughout the country. He was undoubtedly the greatest South Australian botanist of his time and no doubt orchids figured in his field of operations. He is commemorated by one genus and one species of Australian plants (not orchids). He is the author of three orchids: *Caladenia cardiochila* Tate, *C. toxochila* Tate and *C. tentaculata* senso Tate non Schldl. 1847 = *C. filamentosa* R.Br. var. *tentaculata* R.Rogers.

NORTHERN TERRITORY

Not a great deal of botanising was done in the Northern Territory (known as North Australia at the time) last century, but five names are in evidence, three of them alluded to earlier in the talk.

Cunningham, A.

The first botanical exploration (and only coastal) of the Northern Territory apparently was that of Cunningham in Captain P. P. King's expedition. The orchid content of the collection is not known to me.

Foelsche, Paul Heinrich (1831–1914)

Born Moorburg, near Hamburg, Germany, 30/3/1831; died Darwin 31/1/1914. Migrated to the Northern Territory in January, 1870 and appointed sub-inspector of the Northern Territory police force. Was a man of many talents and greatly respected. Was an authority in Northern Territory affairs and aborigines and was a useful botanical collector and correspondent for Mueller. He is commemorated by the names of a mountain, headland and a river in the Northern Territory, a street in Darwin, a species of *Eucalyptus* and an orchid *Dendrobium foelschei* F.Muell. = *D. canaliculatum* R.Br. var. *foelschei* (F.Muell.) Rupp and Hunt.

Holtze, M.

In the early days of settlement at Port Darwin, M. Schultz made extensive botanical collections which were forwarded to Kew. I know nothing about the orchid content of these collections. Holtze carried on the work of Schultze but sent his collections to Mueller. He is commemorated by *Eulophia holtzei* F.Muell. = *Pachystoma pubescens* Blume, *Habenaria holtzei* F.Muell. = *H. rumphii* (Brogn.) Lindley and *Calochilus holtzei* F.Muell.

Leichhardt, F. W. L.

The report of his overland journey from Darling Downs to Port Essington (1844-45) contains much botanical information but here again I am not familiar with the references to orchids.

Mueller, F.

As botanist on Gregory's expedition, collected 1,500 species, including some orchids.

WESTERN AUSTRALIA

Apart from the work of Backhouse, Bentham, Brown, Lindley and Mueller alluded to earlier, the work of seven men contributes very much to our early knowledge of the orchids of Western Australia.

Drummond, James (1784?–1863)

Was curator of the Botanic Gardens of Cork, 1809. Came to Western Australia in 1829 as curator of the Botanic Gardens at Perth and was by far the most successful collector of Western Australian specimens of his time. He collected mainly in sets of six of each collection, plus seeds many of which he dispatched overseas on order or speculation, many ending up at Kew or the British Museum. His collections, including many orchids, formed most of the foundation for Lindley's *"A Sketch of the Vegetation of the Swan River Colony"* (1839), which contained original descriptions of a rather large number of orchids.

He is commemorated by about 200 plants, including three orchids: *Caladenia drummondii* Benth., *Diuris drummondii* Lindley and *Prasophyllum drummondii* Reichb.f.

Huegel, Baron Charles von (? – ?)

A noted Austrian traveller, visited the Swan River Colony in 1833 and made considerable collections, some of his new species being published by Bentham, Endlicher and others.

He is commemorated by almost 30 Australian plants including the orchid: *Cyrtostylis huegelii* Endl. in Lehm.

Lehmann, Johann Georg Cristian (1792–1860)

Was a resident of Hamburg and the author of a large number of botanical works between 1817 and 1856, including an enumeration of the plants of Australasia. In parts of Lehmann's *"Plantae Preissianae"*, Endlicher described a fair number of orchids, some of them from Western Australia.

Menzies, Archibald (1754–1842)

Born at Ween, Perthshire. Employed as a gardener at the botanic gardens, Edinburgh and studied surgery at the university of that city. He became a surgeon in the navy, stationed in America where, in 1791, he joined Captain Vancouver's voyage to King George's Sound, Western Australia, New Zealand and rather many other places. He collected a variety of plants and other specimens of natural history. He bequeathed his herbarium to the Edinburgh Botanic Gardens. He is commemorated by one genus and five species of Australian plants, including one orchid: *Caladenia menziesii* R.Br.

Preiss, Ludwig (1811–1883)

Arrived at Swan River in 1838 and resided there for four years. He often travelled with Drummond. He made large collections (over 2,000), some of which were orchids. His plants were sold in numbered sets. A complete account of them was published by several authors. He is commemorated by numerous Australian plants, including the orchid *Caladenia preissii* Endl. in Lehm.

Purdie, Alexander (1859–1905)

Born Edinburgh, Scotland, died Perth. Left Scotland in his infancy. Educated in Dunedin, New Zealand. Gained a M.A. degree at the University of Dunedin, etc., etc. Was a lecturer in chemistry, assaying and metallurgy at the Bendigo school of mines. At the time of his death he was director of Technical Education in Western Australia. His main interest in botany was orchids. He published in Volume 10 of the Victorian Naturalist, a list of orchids collected near Sale (Victoria) by Misses May, Lilian Wise and Murial Bennett. He delivered a lecture on "Our Native Orchids" before the Mueller Botanical Society in 1900. He is commemorated by a few plants including the orchid *Diuris purdiei* Diels.

Roe, Lieutenant J. S. (1797–1878)

Was a surveyor-general of Western Australia who, in 1848, carried out exploratory work into the interior of south-western Western Australia. In 1831, in company with Sir James Stirling in H.M.S. "Sulphur", surveyed the south coast of Western Australia.

Although not a botanist he never lost the opportunity to collect botanical specimens which were sent to Sir W. Hooker, together with copious notes. He is commemorated by 16 plants, including one orchid: *Caladenia roei* Benth.

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AUSTRALIAN NATIVE ORCHID HYBRID REGISTRATIONS

(New registrations from lists in *The Orchid Review*, November, 1995/February, 1996):–

Name	Parentage	Registered by
Dendrobium		
Bellinger Mist	Ellen X Delicate Ellen	N. Mitchell
Caraking	Carawah X *kingianum*	N. Mitchell (M. Harrison)
Crooky	Lorikeet X *speciosum*	D. Cruikshank (D. Butler)
Desert Rose	Bardo Rose X Hastings	R. & D. Sheen (D. Mitten)
Elegant Coral	Lorikeet X Hilda Poxon	W. T. Upton
Elegant Jewell	Elegant Heart X Harold Hirsch	W. T. Upton
Enzed Magic	Jombock X Doug Burgess	D. Burgess
Freedom	King-Wong X Wonga	R. & D. Sheen
Gillieston Blaze	Brinawa Charm X Lynette Banks	Florafest (W. Skillicorn)
Gillieston Reward	Peewee X Ku-Ring-Gai	W. Skillicorn
Gillieston Surf	Peewee X Hastings	W. Skillicorn
Gillieston Wow	Peewee X King-Wong	W. Skillicorn
Hildale	Hilda Poxon X Elladae	N. Mitchell
Joysum	Joy Wray X X*ruppiosum*	N. Roper
Kayell	Ellen X Hewitt Sun	N. Mitchell
Kayla	Lynette Banks X Tweed	C. Brandon
Kay's Choice	Pinterry X Dot Sheen	N. Mitchell
Lisa Turner	Zip X *speciosum*	J. Purvis
Memoria Ricky Bruschi	Colonial Surprise X Nooro	I. Klein
Piyamal	Montaken X *bigibbum*	T. Vajrabhaya
Ray's Girls	Aussie Child X *tetragonum*	Avril Hill (Ray Hill)
Right On Cue	Ellen X Gracious Falcon	D. Massey
Riversun	Red River X Sunglow	N. Roper
Roslyn Harrison	Ellen X Dot Sheen	N. Mitchell
Starhai	Allstar X Tawhai	N. Mitchell
Tolga	Brolga X Pinterry	N. Roper
Troppo's Dream	Ellen X Numkumbil	J. Mewburn
Troppo's Splendour	Carawah X Pinterry	J. Mewburn
Visheen	Aussie Victory X Dot Sheen	N. Mitchell
Warreen	Warrior X Dot Sheen	N. Mitchell
Wodonga	Yondi X Wonga	R. & D. Sheen
Wonga's Dream	Dream Girl X Wonga	R. & D. Sheen
Parachilus		
Issy's Rainbow	*Prcls.* Selwyn X *Sarc. fitzgeraldii*	Florafest (I. Klein)
Wollumbin Sunrise	*Sarc.* Pinky X *Parasarc. hirticalcar*	Simpson Orchids
Sarcochilus		
Cherie Snow	Cherie X *hartmannii*	K. Wilson
Davey Woolf	Fitzhart X *weinthalii*	Florafest
Fred Conway	Michael Durham X Fitzhart	Florafest
Jeanne	Weinhart X Fitzhart	K. Wilson
Karen	*aequalis* X *falcatus*	Simpson Orchids
Kelunji	Melba X Mavis	Simpson Orchids
Otways Gem	Marion X *australis*	Florafest (L. Fagg)
Pindan Spots	Mavis X *weinthalii*	Simpson Orchids
Pixie Dust	Cherie's Wine X *fitzgeraldii*	Florafest
Redstone	Cherie X Elizabeth	K. Wilson
Tarnie	Weinhart X Heidi	N. Roper

DENDROBIUM FINNIGANENSE D.Jones

Walter T. Upton

I was priviledged to be given some slides of the above species by Geo Productions, taken by Geoff Longford (Plates 22 to 27).

Dendrobium finniganense was named in 1992 and a reprint of the original description appeared in *The Orchadian* Volume 10, Number 12 (1993). q.v.

It was originally collected by Lewis Roberts on Mount Finnigan in north-eastern Queensland, hence its name.

As this species mostly grows among rocks and boulders, in exposed areas, at high elevations in the mountains, it requires high light with a minimum amount of shade.

It is relatively easy to grow, providing its major requirements of good air movement, high humidity and plenty of water in its growing season are met. In the southern areas high light intensity in the winter months is a problem, so greater exposure to full sun is beneficial, but watch those few hot days we occasionally get in the winter, when leaf burn can occur.

In its habitat early morning mists and heavy dews are commonplace.

Pot culture is satisfactory providing it is in an open mix and is allowed to dry out between waterings, although it must never dry out completely. If it dries out completely for a lengthy period it will stop growing and the plant receives a setback, once a bark medium does dry out it is difficult to get it to the right condition again.

If grown on slabs it requires regular and frequent watering throughout the year, in the summer more than once a day. It does not like the hot summer days and requires frequent mistings on these occasions.

A minimum winter temperature of 3 to 6°C is satisfactory, although it can go even lower than this for a very short period without too much harm, but keep away from frosts.

I found to establish a small plant or an aerial, it required much more shade. The aerial can be initially potted in a sphagnum moss medium, but as soon as good root movement is obvious, take it out of the sphagnum moss and treat it as an adult plant.

Like many of our dendrobiums; to flower this species well, a drop in temperature is beneficial to good flower production. In its habitat there is often a considerable difference in temperature between day and night. A study of the habitat of any orchid greatly assists in its cultural requirements.

D. finniganense is very similar to *D. fleckeri* in both plant and flower form but possibly larger and more inclined to produce aerial growths than most plants of *D. fleckeri.* I find that the lithophytic forms of *D. fleckeri* are also prone to producing aerials. ✾

7th Orchid Glenn Nursery

OPEN DAY & SHOW

Sunday, May 19, 1996

at Dungog High School,
Eloiza Street, Dungog

A show for Australian and Exotic Species and Hybrids Orchids

- Benching 2–5p.m. Saturday, May 18 and 7–9a.m. Sunday, May 19, 1996
- Judging 9-10a.m. Sunday, May 19, 1996
- Show open 10a.m.–3.30p.m.
- Presentation of Prizes 3.30p.m. Sunday, May 19, 1996

ADMISSION $2.00

A steak and sausage sizzle is planned. Tea, coffee and other refreshments will be avialable all day. This venue is ideal for children and the whole show is under cover so rain is not a problem

For further information contact Noelene or Ken Russell

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Plant sales commence Sunday 8.00 a.m.

DENDROBIUM FINNIGANENSE D.Jones

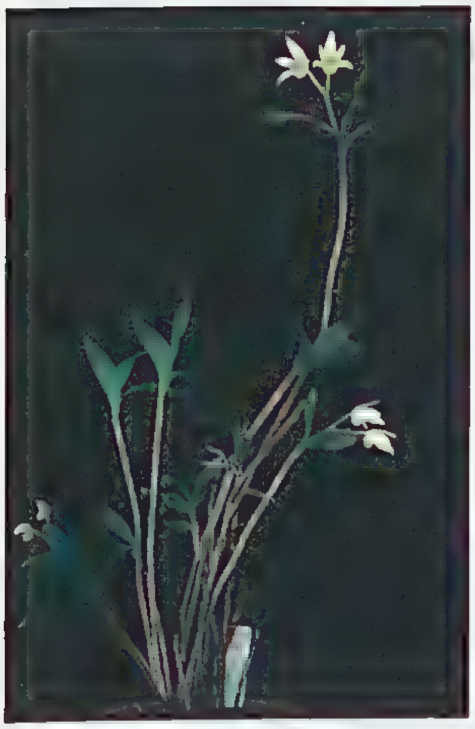

Plate 22: Plant

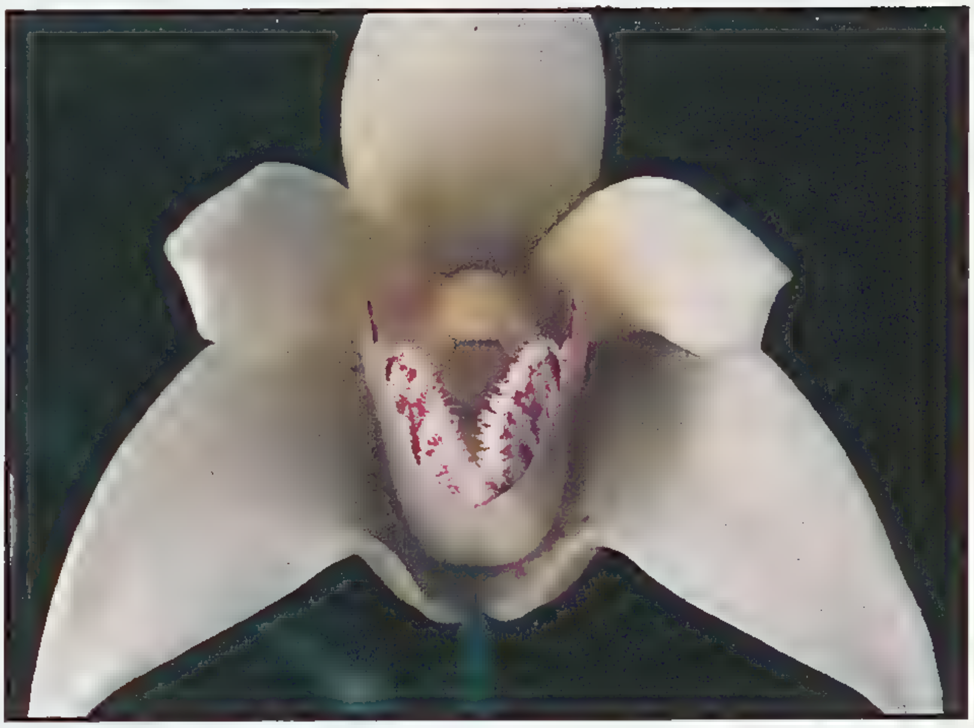

Plate 23: Flower, front view

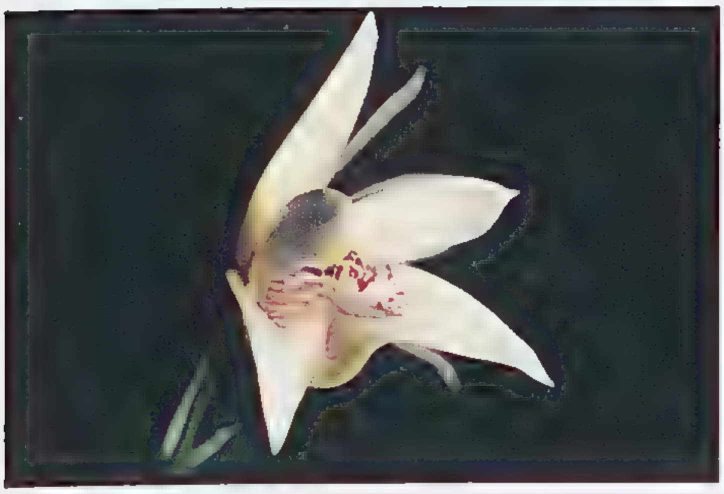

Plate 24: Flower, side view

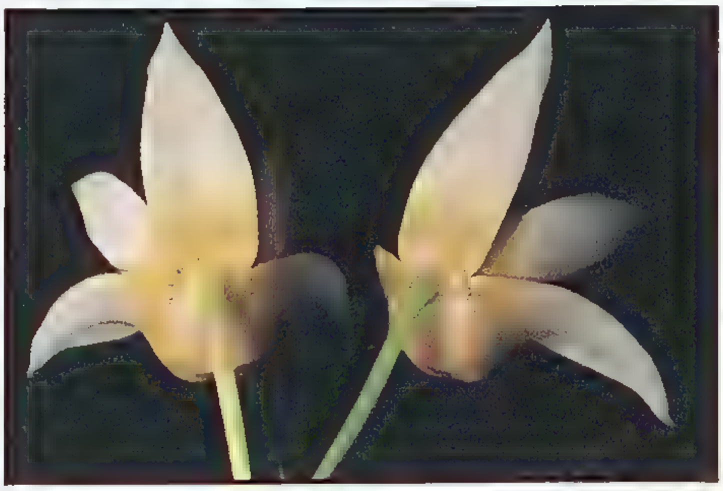

Plate 25: Flowers, back view

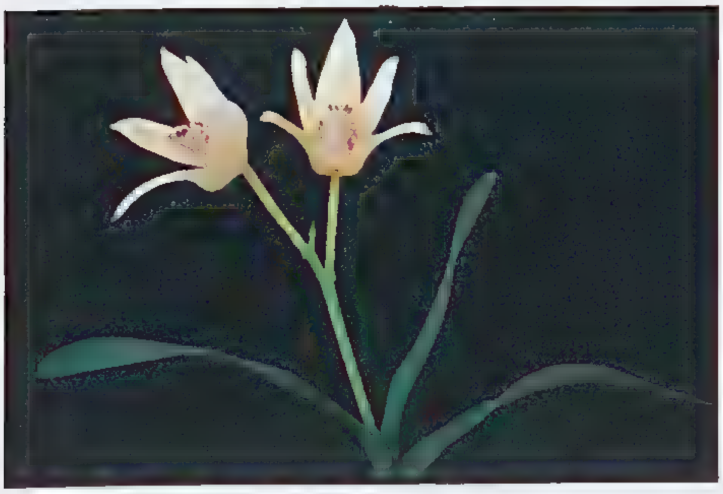

Plate 26: Inflorescence

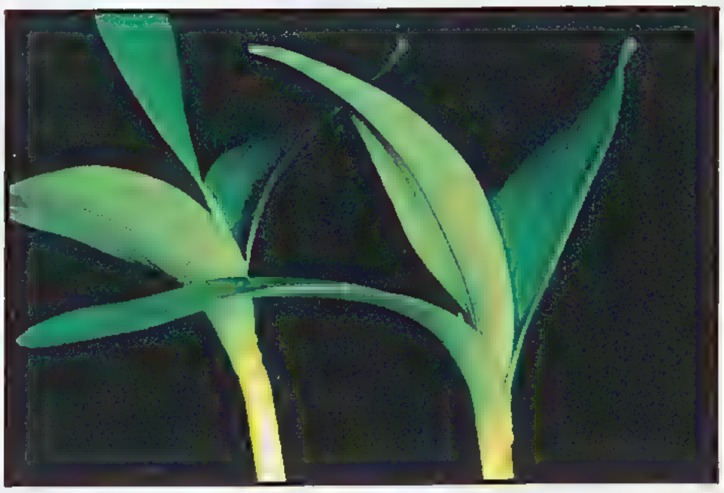

Plate 27: Leaves

Photos by Geoff Longford.

Reprinted from the lecture notes of "A Weekend in Maryborough" presented by The Australasian Native Orchid Society — Wide Bay Group Inc., 1995.

SARCOCHILUS ORCHIDS

Walter T. Upton

This is a relatively small genus of approximately 18 species, 15 of which are found in Australia.

Although the genus was created by Robert Brown in his *"Prodromus Florae Novae Hollandiae et Insulae Van Diemen* in 1810, it was not until the last 10 or so years that it has greatly increased in popularity. The first hybrid was not made until 1963 and now we have no less than 113 (including *Parachilus*) hybrids registered (December, 1995).

The most commonly grown and indeed the easiest to grow are *Sarcochilus hartmannii, S. fitzgeraldii, S. ceciliae* and *S. falcatus* and furthermore these are the species most used in hybridising.

CULTURE

In general terms this is one of the easiest genera to grow providing a few criteria are rigidly applied. First and foremost maintain a healthy root system; this can be achieved by growing your *Sarcochilus* in a clean, well ventilated, environment, with a cool moist atmosphere and in shady to semi-shady conditions. The medium should be fairly open so that oxygen can get to the roots. Good drainage is essential, they do not like a wet, soggy and airless medium. In a nutshell, cool, moist, shady conditions with an abundance of air movement.

The genus can be divided into two main categories:–

1. **The Lithophytes —**
   S. hartmannii (Plate 28), *S. fitzgeraldii* (Plate 29), *S. ceciliae* (Plate 31) and *S. roseus* (Plate 30). These prefer pot culture, 60% shade and a minimum winter temperature of approximately 6°C maybe a little warmer for the northern form of *S. ceciliae* and *S. roseus.*
2. **The Epiphytes —**
   S. australis (Plate 32), *S. dilatatus* (Plate 33), *S. falcatus* (Plate 34), *S. hillii* (Plate 35), *S. hirticalcar* (Plate 36), *S. minutiflos* (Plate 37), *S. moorei* (Plate 38), *S. olivaceus* (Plate 40), *S. serrulatus* (Plate 39), *S. spathulatus* (Plate 41) and *S. weinthalii* (Plate 42). These prefer slab culture and a minimum winter temperature of approximately 2–6°C, with the exception of *S. hirticalcar, S. minutiflos* and *S. moorei* which require a minimum of 12°C. Shade varies between 60% and 70%.

Generally the lithophytes require less shade than the epiphytes. A study of the habitat conditions is more essential for the lithophytes, as these are more difficult to grow.

HOUSING

I prefer to grow these orchids under a fibreglass (or similar) roof, with 60–70% shadecloth sides. From my experience they do not like the hot summer rains or for that watter, the cold rains in winter. Strong winds are not good, so try to place the shadehouse in an area were there is a good through movement of air but not direct wind.

POTTING

Sarcochilus orchids are most active in the autumn (March to May), many continue to grow throughout the winter. A period of semi-dormancy in the warmest months is experienced with most species. The best time to repot, therefore, is during the autumn.

Some media components are: bark, pebbles, hard sandstone, peat moss, leafmould, dried tree fern fronds, charcoal and some manure, sheep or poultry. Which and how much of each component greatly varies, according to one's own preferences. To keep roots cool, one good practice is to place rocks on top of the growing media.

Do not allow the centre of the media in the pot to become too wet; placing an empty pot upside down in the bottom of the pot to be repotted will eliminate this problem.

S. ceciliae and *S. roseus* grow best in shallow saucers, in a open potting medium, to allow plenty of air to the roots. Keep the plant well above the surface of the medium.

SLAB CULTURE

With slab culture, care must be taken in selecting the slab, the roots of the epiphytic *Sarcochilus* are extensive. Plants on slabs receive an abundance of air movement, but they need more water than a plant in a pot. Ensure the plant is tied very securely to the slab, the roots cannot become attached if there is any movement. Examine the plant to be attached, making sure it is placed on the slab the right way up. It is most important, with slab cultured plants, that the air is cool and humid at all times.

WATERING

These orchids do not have pseudobulbs in which to store water in lean times, so all-year-round watering is necessary, using great caution in the winter. With the *Sarcochilus,* like all orchids, they need to dry out for various periods of time, in the summer months every day, but during their active growing period they need to be kept just moist.

FERTILISING

I find that a weak fertiliser twice a week from September to May is beneficial.

FLOWERING

To ensure a good flowering give your plants a little more light in the winter months, this particularly applies to *S. ceciliae.*

HYBRIDS

Now let us consider hybridising within the genus *Sarcochilus.* This genus is quickly becoming very popular with native orchid growers, I think mainly because of the plant size and the very attractive flowers. There is nothing more beautiful than to see a bench of *Sarcochilus* species and hybrids in full flower, all on the same level and of many different colours.

To look at this genus with your area, south-east Queensland, in mind, we must consider the hybrids with the warmer growing parents, *Sarcochilus* in general are cool growing orchids, most growing well in bushhouses in Melbourne and also in Tasmania.

The species requiring some warmth are *S. moorei, S. hirticalcar* and *S. minutiflos.* A minimum of 12°C in winter.

S. ceciliae, S. dilatatus, S. roseus, S. serrulatus and *S. spathulatus* prefer a winter minimum of 6°C.

The very popular *S. hartmannii, S. fitzgeraldii* and *S. falcatus* are, however, reasonably amenable to warmer temperatures or at least many clones of these species are.

In my opinion those hybrids with *S. ceciliae* in their background are most suitable to your area.

S. Kathy (*S. ceciliae* X *S.* Mavis)

75%	*S. ceciliae*
25%	*S. fitzgeraldii*

Very upright raceme of flowers, well positioned and facing the top.

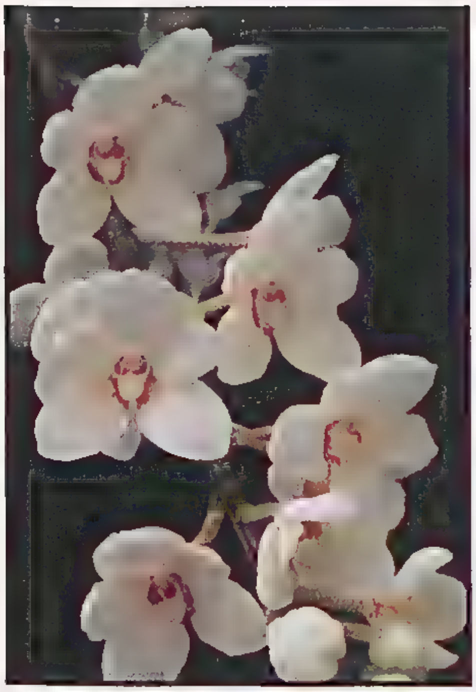
Plate 28: *Sarcochilus hartmannii*

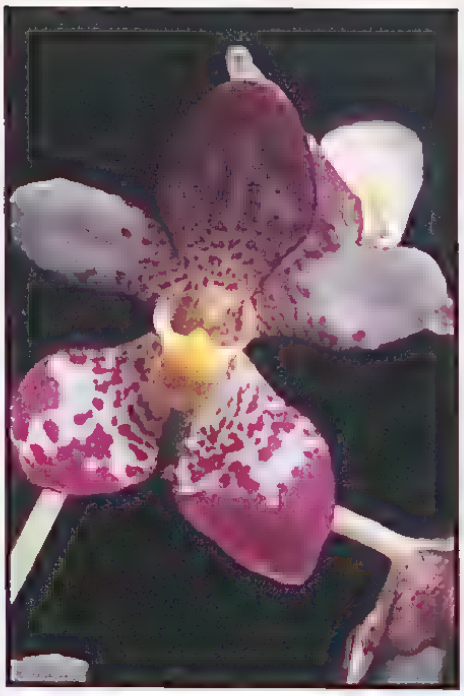
Plate 29: *Sarcochilus fitzgeraldii*

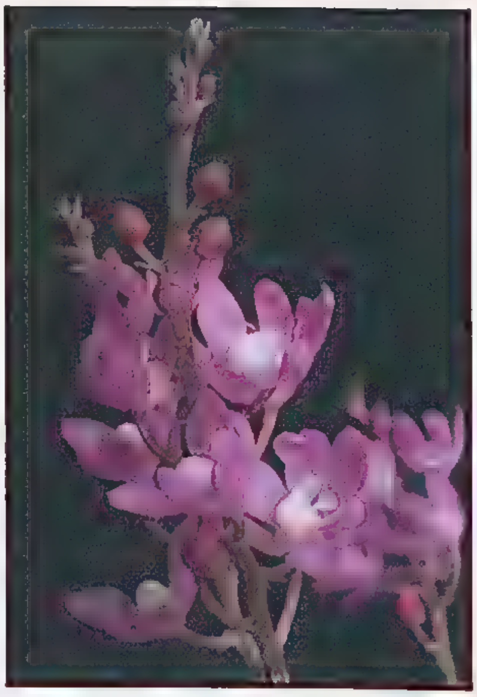
Plate 30: *Sarcochilus roseus*

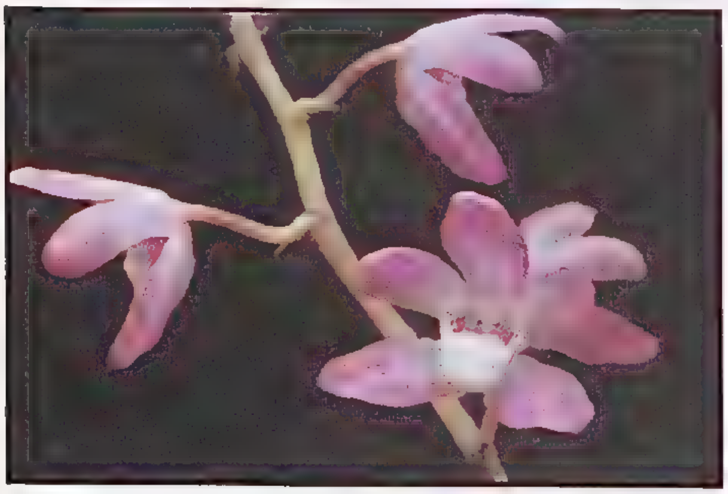
Plate 31: *Sarcochilus ceciliae*

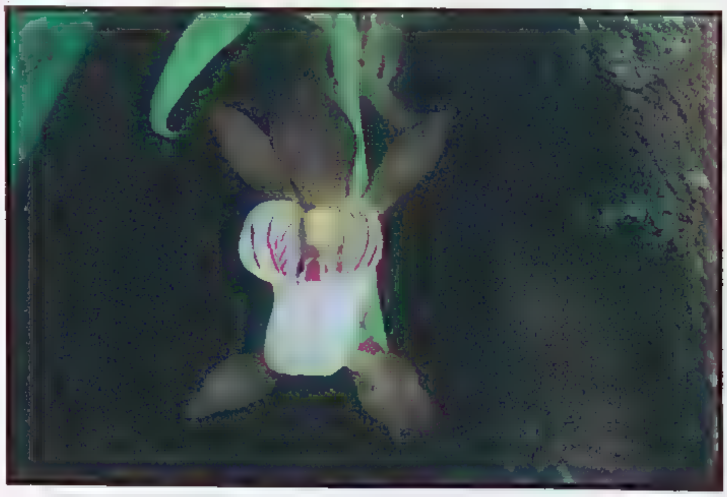
Plate 32: *Sarcochilus australis*

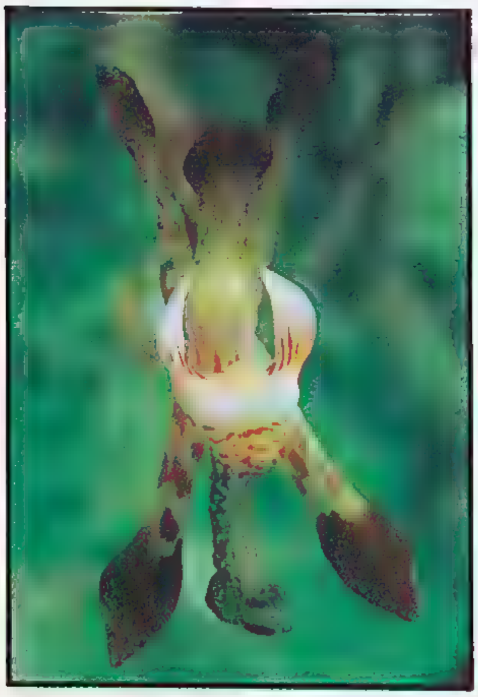
Plate 33: *Sarcochilus dilatatus*

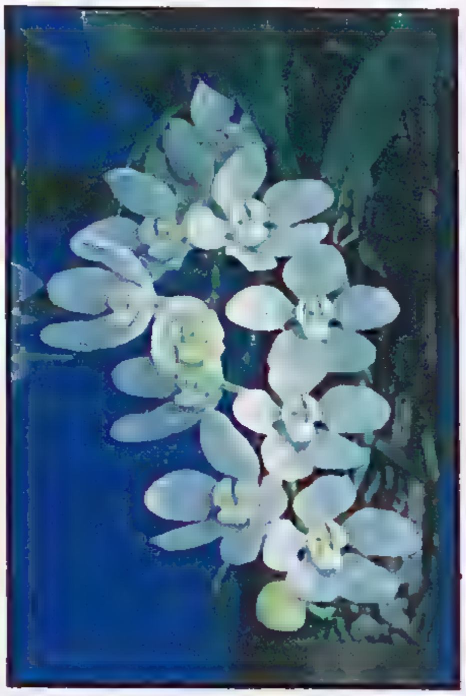
Plate 34: *Sarcochilus falcatus*

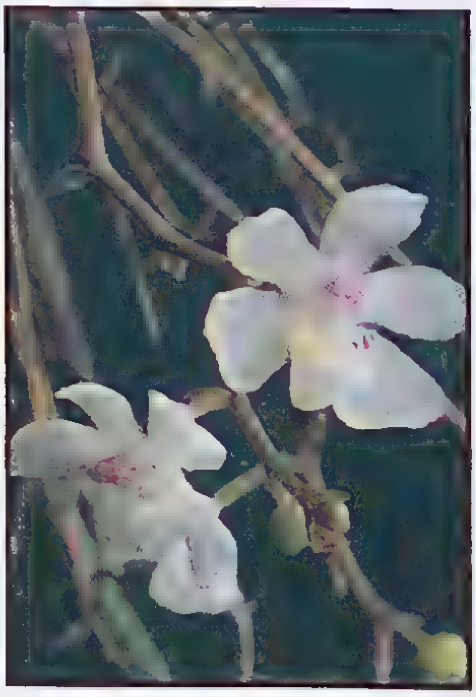
Plate 35: *Sarcochilus hillii*

Photos by W. T. Upton.

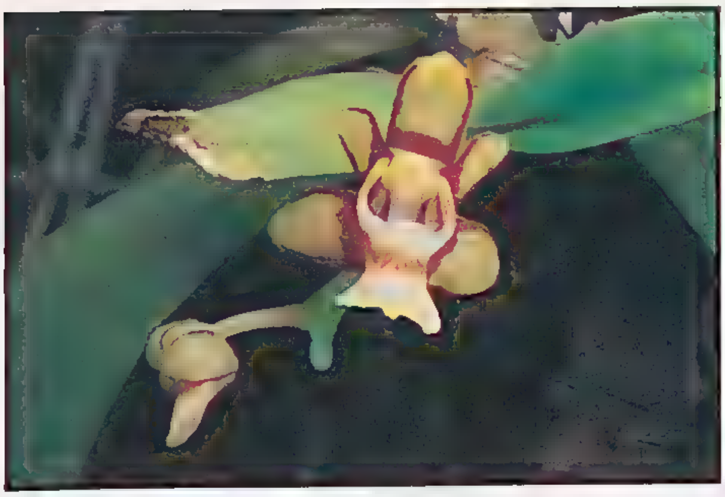

Plate 36: *Sarcochilus hirticalcar*

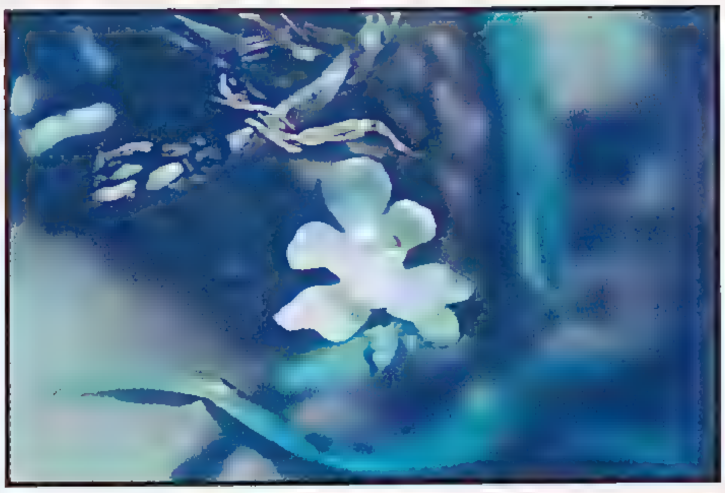

Plate 37: *Sarcochilus minutiflos*

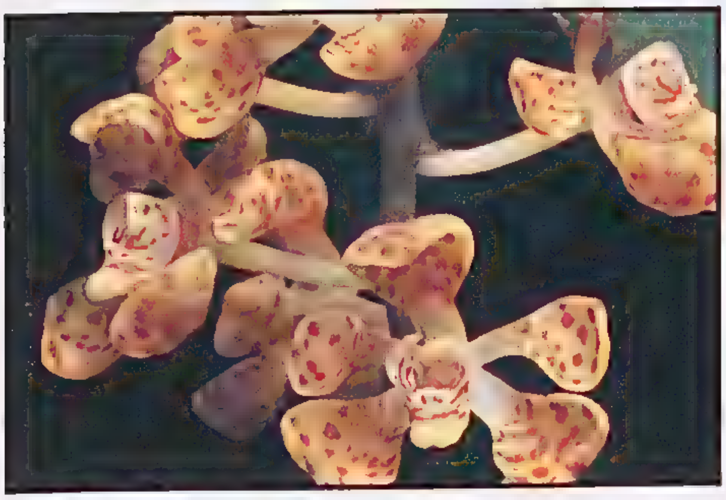

Plate 38: *Sarcochilus moorei*

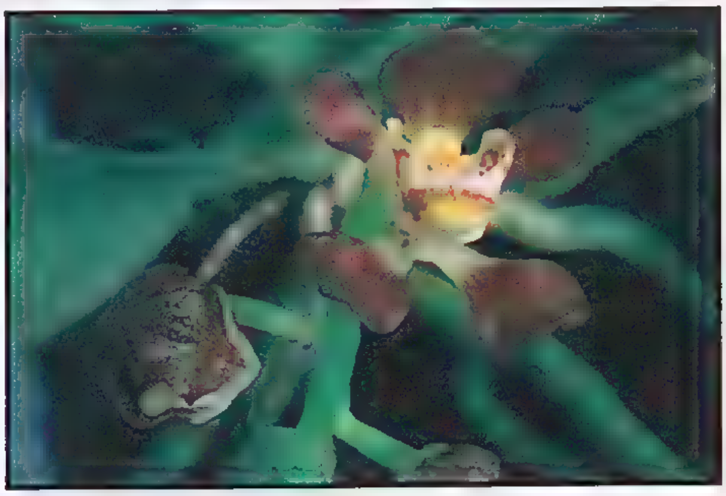

Plate 39: *Sarcochilus serrulatus*

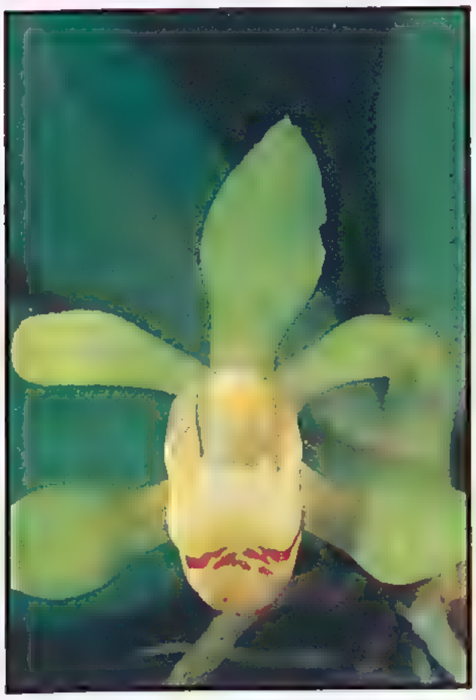

Plate 40: *Sarcochilus olivaceus*

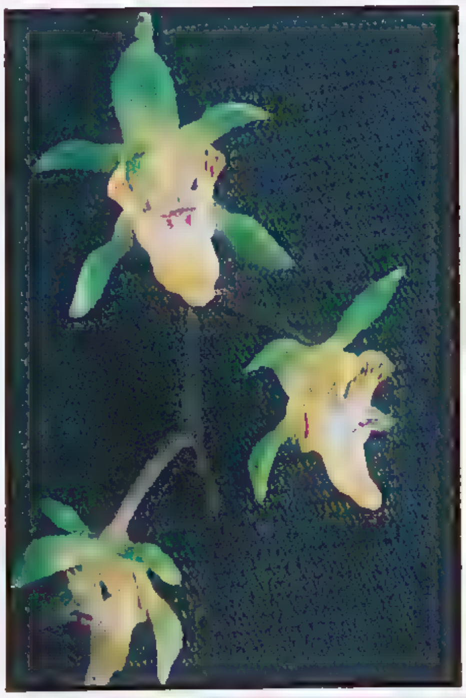

Plate 41: *Sarcochilus spathulatus*

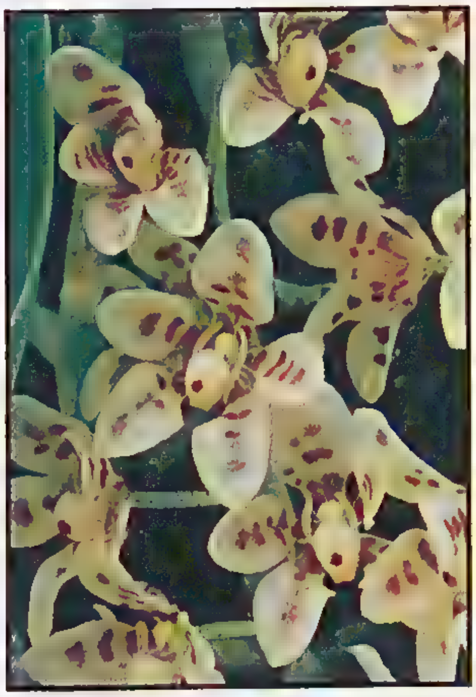

Plate 42: *Sarcochilus weinthalii*

Photos by W. T. Upton.

S. Sue (*S.* Empress X *S.* Kathy)

75%	*S. ceciliae*
12.5%	*S. fitzgeraldii*
12.5%	*S. hartmannii*

A good dark pink of good shape and with an arching to upright raceme.

Parachilus Frances (*Sarcochilus ceciliae* X *Parasarcochilus hirticalcar*)

A most attractive and colourful small orchid which is seldom out of flower.

Unfortunately when registering hybrids with *Sarcochilus hirticalcar* in the parentage, we have to register it under an earlier name *Parasarcochilus hirticalcar,* so therefore it appears in the hybrid genus *Parachilus.*

Parachilus Sweetie (Sarcochilus Mavis X *Parasarcochilus hirticalcar*)

Also a plant which flowers continuously throughout most of the year.

Parachilus Polka-Dot (*Sarcochilus* Pinkhart X *Parasarcochilus hirticalcar*)

50%	*Sarcochilus hirticalcar*
37.5%	*S. hartmannii*
12.5%	*S. ceciliae*

Well marked and most colourful.

S. Selina (*S.* Arcadia X *S. fitzgeraldii* 'Lorraine')

Some good shapes, sizes and colours out of this cross.

62.5%	*S. fitzgeraldii*
25%	*S. hartmannii*
12.5%	*S. ceciliae*

S. fitzgeraldii is producing good colours, particularly *S. fitzgeraldii* 'Lorraine'.

S. Elizabeth (*S.* Lois X *S. fitzgeraldii*)

Similar to the previous cross, but more *S. ceciliae* and less *S. fitzgeraldii.*

50%	*S. fitzgeraldii*
25%	*S. hartmannii*
25%	*S. ceciliae*

Many of the *S. hirticalcar* crosses are most colourful and of good shape. As well as the three crosses previously mentioned, another one of note is *Parachilus* Riverdene (*Sarcochilus hartmannii* X *Parasarcochilus hirticalcar*). A very flat flower of good substance.

Similar hybrids to the ones using *Sarcochilus hirticalcar* are those with *S. spathulatus* (*Parasarcochilus spathulatus*) as one parent. Mostly very colourful hybrids with large side lobes to the lip, a characteristic from *Sarcochilus spathulatus.*

Parachilus Tigress (*Sarcochilus* Fitzhart X *Parasarcochilus spathulatus*)

Many well-marked orange/brown flowers.

Parachilus Selwyn (*Parachilus* Perky X *Sarcochilus fitzgeraldii*)

50%	*S. fitzgeraldii*
25%	*S. hartmannii*
25%	*S. spathulatus*

Mostly heavily marked with red/purple. Very free flowering.

Two *S. weinthalii* hybrids of note are:–

S. Susan (*S. falcatus* X *S. weinthalii*)

Small flowers but some are an unusual slate grey to almost blue in colour.

S. Aussie Weinman (*S.* Weinhart X *S. hartmannii*)

75%	*S. hartmannii*
25%	*S. weinthalii*

Good shape with a slightly green tinge, very florific. They make up quickly into specimen plants.

A hybrid using *S. dilatatus* has got both shape and colour as well as being attractively marked.

S. First Light (*S.* Aussie Dawn X
S. hartmannii)
75% *S. hartmannii*
25% *S. dilatatus*
Two clones 'Pepper' and 'Butter Scotch' have already received HCC's from NSW and AOC.

Some well marked and red clones of *S. fitzgeraldii* are producing very colourful progeny.

S. Cherie (*S.* Fitzhart X *S. fitzgeraldii*)
75% *S. fitzgeraldii*
25% *S. hartmannii*

S. Heidi (*S.* Fitzhart X *S. hartmannii*)
75% *S. hartmannii*
25% *S. fitzgeraldii*

Many clones of *Sarcochilus* hybrids make up quickly into very florific specimens. An example of this is:–

S. Melody (*S.* Melba X *S. fitzgeraldii*)
50% *S. fitzgeraldii*
25% *S. hartmannii*
25% *S. falcatus*

The use of *Phalaenopsis amabilis* var. *papuana* with *Sarcochilus* has produced some excellent hybrids, the two registered are:–

Sarconopsis Lavinia (*Sarcochilus hartmannii* X *Phalaenopsis amabilis*).
Originally made by Roger Bedford in 1981. This will grow and flower much better in your climate than ours down south and is worth having in any collection.

Sarconopsis Aussie Jem (*Phalaenopsis amabilis* X *Sarcochilus ceciliae*)
Made by Philip Spence in 1983. Smallish flowers of a good pink on a upright raceme.

A few hybrids using exotic orchid hybrids and species are worthy of note:–

Sarcochilus hartmannii X *Phalaenopsis* Lipstadt
Colourful red/pink flowers about 50mm across.

Sarconopsis Elanora (*Sarcochilus* Mavis X *Phalaenopsis* Comtesse Bettina)
Good pink flowers about 50mm across. Ease of culture.

Sartylis Blue Knob (*Sarcochilus hartmannii* X *Rhynchostylis retusa*)
Flowers profusely and continuously.

Leaneyara Rosy charm (*Sartylis* Blue Knob X *Ascocenda* Rumrill)
Named after Reginald F. Leaney who died in 1972, a well-known Sydney orchid grower. A most attractive small plant with many 30mm red/pink flowers.

Uptonara Jill (*Sartylis* Blue Knob X *Sarconopsis* Lavinia)
Ease of culture and seldom without flowers. ✻

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IRA BUTLER TROPHY COMMITTEE

CHAMPION AUSTRALIAN NATIVE ORCHID SPECIES OF THE YEAR

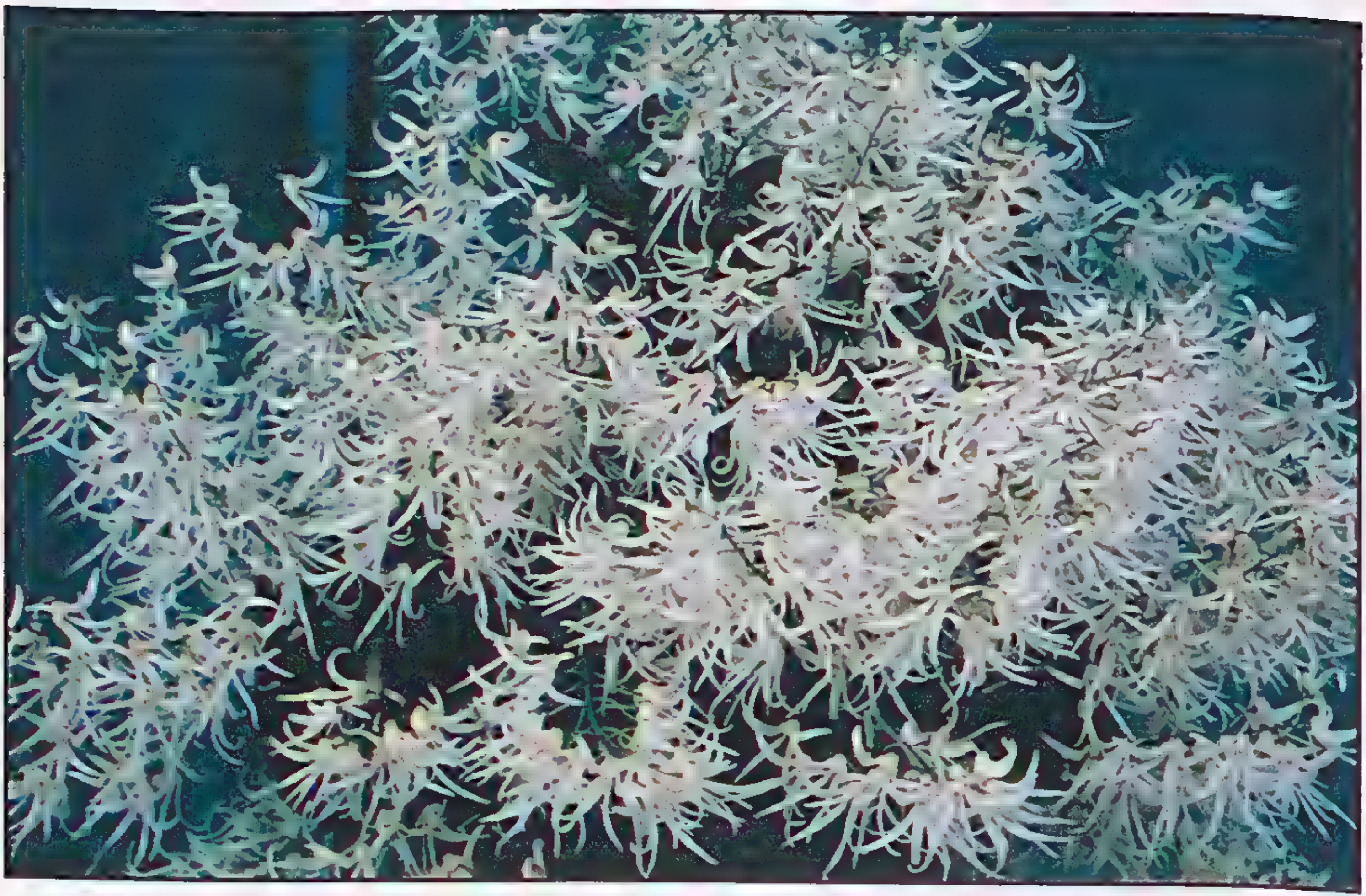

Plate 43: *Dendrobium linguiforme* 'Jean'

GRAND CHAMPION AUSTRALIAN NATIVE ORCHID HYBRID OF THE YEAR

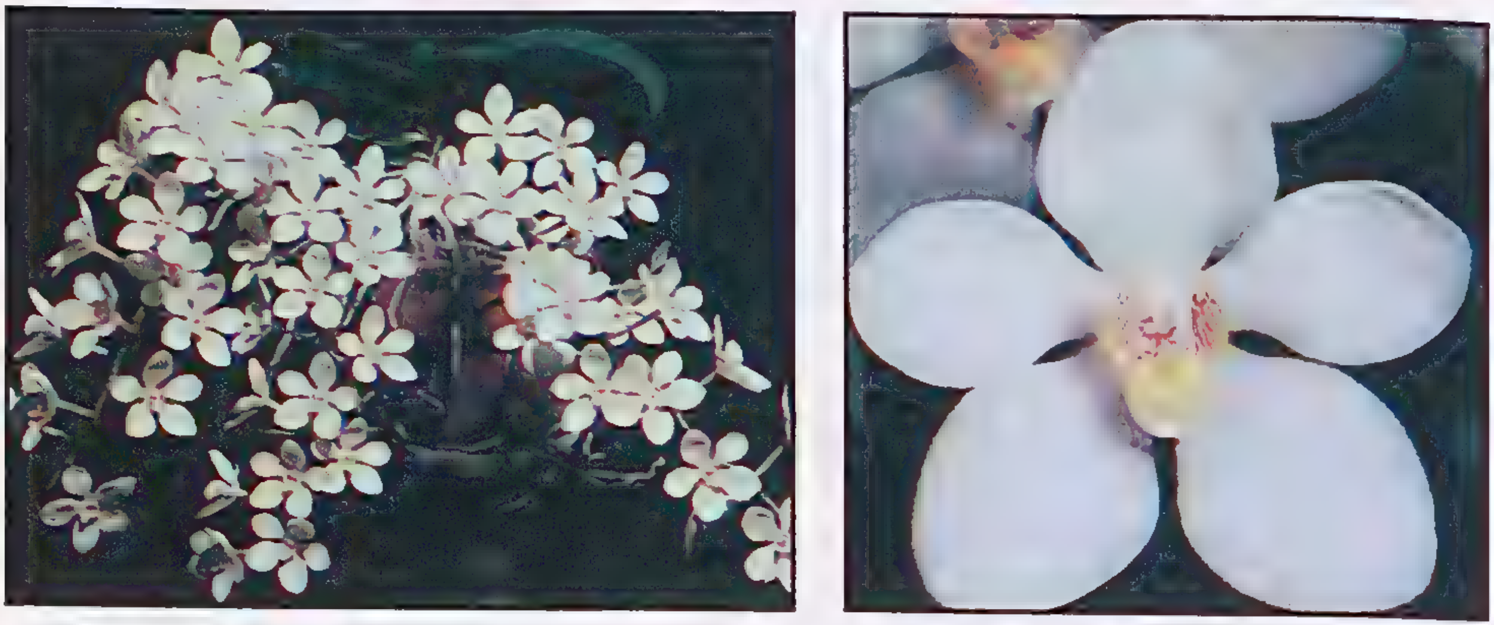

Plate 44 and 45: *Sarcochilus* Judith 'Snowy'

IRA BUTLER TROPHY COMMITTEE

CHAMPION AUSTRALIAN NATIVE ORCHID SPECIES OF THE YEAR — 1995

The winners of the BILL MURDOCH TROPHY are M. & J. Fruend with *Dendrobium linguiforme* 'Jean' (Plate 43)

This magnificent specimen plant was not only unusually floriferous but the flowers were of very good quality, as was shown on the slides provided. It was the Grand Champion of the Wangaratta and District Orchid Society's spring show held last September. The information given on the nomination form was that there were 117 racemes and 2,106 flowers and the plant was at its best at the show.

There were 23 nominations again this year. Unfortunately the photography in some cases could have been greatly improved. In some slides details of the flowers could not be seen because of over exposure and in others because they were too dark. Several entries were accompanied with unlabelled slides. One plant, *D. bigibbum* 'Top Hat' was nominated by both the O.S.N.S.W. and A.N.O.S. In future the nomination form for a plant which has won an award, must be accompanied by three slides which remain the property of the Ira Butler Committee. They may not be the slides which were sent for the award because these are the property of the awarding body.

Some of the line bred plants were rather small, but individual flowers showed that they could be potential show winners. In some cases good specimen plants did not have outstanding flowers. The champion should preferably be well flowered on a quality plant with quality flowers and photographed to perfection.

There is only one Bill Murdoch Trophy given each year. The following is a list of plants that were nominated:–

From State Orchid Societies, the Champion Australian Native Species —

O.C.S.A. – Autumn Show – *Pterostylis dolichochila.* Winsome and Les McHugh.
– Winter Show – *P. curta.* Peter Speer.
– Spring Show – *Dendrobium speciosum* 'Yondi'. Bruce Mules.
O.S.N.S.W. – Spring Show – *Cymbidium canaliculatum.* Trevor and Pauline Onslow.
O.S.W.A. – Spectacular – *Pterostylis* aff. *nana.* P. Bunney.
– Winter Show – *P. ophioglossa.* Ross and Margaret Wilton.
– Spring Show – *Caladenia longicauda.* Rodney Steer.
Tas.O.S. – Spring Show – *Sarcochilus falcatus* 'Snowdrift'. David and Coralie Best.

State Affiliated Society, Grand Champion of the Show —

Stawell Orchid Society – Spring Show – *Dendrobium speciosum.* L. & N. Crawford.
Dungog Show – *D. bigibbum* 'Top Hat' AM/ANOS, HCC/NSW. Henk van den Berg.
Mandurah O.S. – Spring Show – *D. jonesii.* Ken Gorey.

A.N.O.S. Groups or Native Orchid Societies, Champion Australian Native Orchid Species —

Macarthur & D. Group – Spring Show – *D. kingianum* 'Elderslie'. Norm Biffen. Line bred by Sid Batchelor.
N.O.S.S.A. – Spring Show – *D. speciosum* var. *grandiflorum.* Peter Barnes. Line bred by Arambeen Orchids.
Port Hacking Group – Spring Show – *D. speciosum* 'National White'. Col Brandon.
– *Sarcanthinae* Show – *Sarcochilus hartmannii* 'BK' X *S.* Red Snow. Col. Brandon. Line bred by Ken Russell.

Sydney Group – Spring Show – *Caladenia eminens*. Doug Binns.
 – *Sarcanthinae* Show – *Sarcochilus falcatus*. Gerry Walsh.
Warringah Group – Spring Show – *Dendrobium speciosum* var. *speciosum*. Chris Arnott.
A.N.O.S. W.A. – Spring Show – *D. aemulum*. Rod Bitton.
Wollongong & D.N.O.S. – Spring Show – *D. striolatum*. B. & H. Morton.
 – *Sarcanthinae* Show – *Sarcochilus hartmannii* B.K. 'Yondi' X *S. hartmannii* N.V. 'Red Snow' HCC/ANOS. Alan Stephenson. Line bred by Neil Finch.

Of the 23 plants nominated, five were line bred and one had two awards. Eleven plants were from State Societies or Affiliates, while 10 were from A.N.O.S. or other Native Orchid Societies. Congratulations to all the growers, their societies, judges and show marshals and thanks to the photographers, without whom there would have been no competition.

Good growing everybody, from Ruth Rudkin, Honorary Secretary.

THE GRAND CHAMPION AUSTRALIAN NATIVE ORCHID HYBRID OF THE YEAR — 1995

The winner of THE GOLD IRA BUTLER TROPHY is Bill Kennewell, with *Sarcochilus* Judith 'Snowy' (Plates 44 & 45)

The photographic slides provided with this nomination showed the plant and its flowers to perfection. There were four racemes with a total of nearly 60 flowers on a single growth 160mm high. The flowers were of good texture, in pristine condition, well rounded in outline and flat. The tepals were a pure white, highlighted by a yellow labellum and an unusually dark rachis. The inflorescences were straight and strong, with the flowers in a very regular alternate arrangement.

S. Judith 'Snowy' was Champion Australian Native Orchid Hybrid at two A.N.O.S. *Sarcanthinae* shows, Macarthur and then Sydney and nominations and slides came from both. The plant had been purchased from Florafest Orchids. *S.* Judith is a hybrid of *S.* Melba X *S.* Fitzhart, first registered by W. Upton in 1992.

This year there were 27 nominations of which five were of plants which had gained awards. Unfortunately, in some cases the slides provided, were from the organisation giving the awards, rather than from the owner of the plant. The Ira Butler Committee requires three slides. Although the photography was good in many of the slides, in some cases it was poor, either under or over exposed or the plant was not shown to its best advantage. Some slides showed plants with damaged leaves and others merely showed the whole plant at different distances, rather than showing a close-up of a few flowers. Floriferous plants have a clear advantage over a small plant with a few good flowers.

Silver Ira Butler Trophies have been won by the following:–

State Orchid Societies for plants which have been Champion Australian Native Hybrid of their shows —

O.C.S.A. – Autumn Show – *Dendrobium* Chieno 'Grange'. Reg and Gill Shooter.
 – Winter Show – *D.* Hilda Poxon. D. and B. James.
 – Spring Show – *D.* Elegant Heart 'Blush'. B. Mules. Hybridist: B. Mules.

O.S.N.S.W. – Spring Show – *Rhinochilus* Vera 'Mount Colah'. J. K. Irvine. Hybridist: J. K. Irvine.

O.S.W.A. – Spectacular – *Dendrobium* Red River No. 2. F. and H. Vernon. Hybridist: Neville Roper.
– Winter Show – *D.* Hilda Poxon 'Dandy'. John Fleming. Hybridist: N. Grundon.
– Spring Show – *D.* Yondi X *D.* Wonga. F. and H. Patfield. Hybridist: Neil Finch.

Grand Champion of a State Affiliated Society —

Mandurah O.S. – Spring Show – *D.* Clarrie Wuth 'Ann'. Wally Heath. Hybridist: Florafest.

Upper Hunter O.S. – Spring Show – *D.* Star of Riverdene. Henk van den Berg. Hybridist: Sid Batchelor.

Australian Native Orchid Champion of an A.N.O.S. Council or Group or Native Orchid Society Show —

Central Coast – Spring Show – *D.* Emma 'Suzy' HCC/ANOS. Henk van den Berg. Hybridist: Gordon Young.

Macarthur & D. Group – Spring Show – *Sarcochilus* Melba. H. and D. Turner. Hybridist: Neil Finch.

N.O.S.S.A. – Spring Show – *Dendrobium* X*delicatum* 'Kerry'. Bruce Mules.

N.O.S.T.I. – *Sarcanthinae* Show – *Sarcochilus* Kelunji 'First Up'. Simpson Orchids. Hybridist: Simpson Orchids.

Port Hacking – Spring Show – *Dendrobium* Karsun 'Goldie'. N. Roper. Hybridist: Col Brandon.
– *Sarcanthinae* Show – *Sarcochilus* Melody 'Red Edge'. Dennis Wood. Hybridist: Kevin Wilson.

Sydney – Spring Show – *Dendrobium* Yondi Tina 'Goliath'. Bernie Fletcher. Hybridist: Sid Batchelor.

Warringah – Spring Show – *Cymbidium* 'Little Black Sambo'. John Roberts.

W.A. – Spring Show – *Dendrobium* Kathryn Banks 'Jen' X *D. falcorostrum* No. 1. Richard Winch. Hybridist Sid Batchelor.

Wollongong & D.N.O.S. – Spring Show – *D.* 'Star of Riverdene'. Bruce Porter. Hybridist: Sid Batchelor.
– *Sarcanthinae* Show – *(Sarcochilus* Melody X *S. fitzgeraldii)* X *S. hartmannii.* A. and T. King. Hybridist: Ken Russell.

The following awarded plants were nominated but were not show champions and therefore do not get a Silver Trophy:–

A.N.O.S.(N.S.W.) – *Dendrobium* Yondi Brolga 'Yondi' HCC/ANOS. Henk van den Berg. Hybridist: Sid Batchelor.

N.O.S.T.I. – *Sarcochilus* Weinhart 'Lonesome' HCC/ANOS. Alwyn Fleming.

O.S.N.S.W. – *Dendrobium* Tropical Witt 'Freckles' HCC/NSW.

Tas. O.S. – *D.* Miara 'Shirley' HCC/TAS. Gerald and Shirley Knight. Hybridist: Wal Upton.

All on the Ira Butler Trophy Committee are aware of the difficulties involved in orchid photography and even more of the problems at shows. So congratulations to all who sent in nominations to the growers, photographers, Show Marshals and Registrars. Special thanks to those who sent in the nominations early so that they could get on "disk" well before the judging.

From the Ira Butler Trophy Committee, good growing and successful shows in 1996.
Ruth Rudkin, Hon. Secretary ✾

GROWING THOUGHT

Generally the leaves of a plant are placed so as to expose as large a surface of each leaf blade to the sunlight as possible. They require this light for their function of manufacturing food for the plant. Place your orchids as advantageously as possible to accomplish this. **Do not overcrowd.** ✾

AUSTRALIAN NATIVE ORCHIDS — DEVELOPMENT OF A PRACTICAL, ACHIEVABLE CONSERVATION POLICY

Alan Dash
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This is not a scientific paper, but the conclusions drawn by an amateur, after a long period of observation and experience.

Many of the assumptions made are yet to be tested by scientific methods.

I do not claim to have all the answers, but have listed what I consider to be important points for your consideration. Your critical comments would be appreciated so that we can develop an effective policy.

Not all the points listed here are original, but I am not able to credit the authors in this paper, because the information, although sourced from published material, has been dredged from the back of my mind and the initial articles are unremembered.

I do not intend to deal at length with illegal collection. This subject has been regularly discussed and naturally, the practice is to be deplored.

I intend to concentrate on what is undoubtedly the most serious problem threatening many species of native fauna and flora and specifically orchids, which is habitat destruction.

Indigenous orchids are as unique as our more celebrated flora and fauna, having evolved during the millions of years of isolation this continent has enjoyed and have adapted to the climate as this also changed.

Many have developed symbiotic and saprophytic relationships with other plants and fungii and have unique pollination requirements where, in many cases, the only protection against hybridisation is the exclusive relationship between specialised pollination vectors and individual orchid species.

Their distribution has only marginally altered during the last few thousand years of human occupation, despite being eaten by both humans and animals.

The major impact during this period was the modification of the vegetation by the aboriginals' use of fire.

However, the past 200 or so years of European occupation and exploitation has been disasterous for many species, with total destruction of large tracts of former habitat, serious degradation of a great deal of the remainder and the introduction of insects, competing weeds and hard-hooved grazing animals.

I suspect that the recent identification of increasing numbers of "natural" hybrids is a direct result of the introduction of a number of insects and birds who are not species selective.

Orchids are generally prolific seed producers, but the rigid conditions required for germination ensure a very low survival rate. It would be reasonable to assume that undisturbed localities at present not supporting populations of orchids have some characteristic unfavourable to seed germination.

I know many localities where one gully supports extensive colonies of orchids, while, in adjoining gullies, not a single plant can be found.

From my observation, the specialised germination requirements are the major factor determining the distribution of many species.

Orchid seed is minute and the seed of epiphytic species which grow high in trees or on cliffs may be carried by the wind for long distances.

However, I suspect that the seed of deciduous terrestrial orchids is not as widely distributed as the plants are more or less contained by grasses and ferns. This would be the case even for those species which elongate their stem after fertilisation.

I therefore think that natural areas which do not support orchid colonies are unsuitable sites for relocation of orchids salvaged from development sites.

I consider the test for successful re-establishment of orchid colonies is the subsequent appearance of seedlings. The colony is not viable in the long term otherwise.

On the Central Coast of New South Wales, restricted germination is particularly evident in colonies of *Dendrobium teretifolium* and *D. aemulum*.

Both these species are locally common and in this area, occur only on specific hosts, *D. teretifolium* on Swamp Oak (*Casuarina glauca*) and *D. aemulum* on several species of Ironbark (*Eucalyptus* spp.).

Not only do they live exclusively on these species, they only colonise mature trees.

I am familiar with localities where considerable stands of host species of all ages are intermixed. The mature trees support extensive colonies of orchids, while few, if any, grow on the younger trees. One such area (last logged in 1948), has extensive stands of Ironbark regrowth, now approaching 50 years of age. Amongst these trees are the odd, mature, fire or lightning damaged Ironbark, which was ignored by the loggers. These old trees are covered with *D. aemulum,* but I have been unable to find a single plant on the numerous younger trees, although some of them are quite large.

I have salvaged orchids of both species from fallen trees and attached them to the younger trees, where they have become well established and appear quite healthy.

The lack of naturally growing plants on the younger trees suggests to me that some germination requirement is lacking.

It is worth noting that both these species (and many others) thrive on, and in, a variety of mounts and potting mixes in growers' bushhouses.

I suspect that similar germination limitations exist for the majority of epiphytic and terrestrial species.

Orchid populations may well be considered indicator plants for the welfare of natural ecosystems. They are one of the first plant groups to suffer when an ecosystem is disturbed and because of their specialised relationships, one of the last to recover.

There are many "revegetated" and "rehabilitated" so-called "natural areas" which once supported a diverse range of orchid species where now none exist.

Bushland areas in the vicinity of population concentrations are increasingly subjected to "beautification" and fire hazard reduction.

This usually involves the removal of the understorey and mowing or slashing to facilitate human access or regular burning during winter and spring which is the orchid flowering period. The result of these activities is generally the creation of ideal conditions for the invasion of introduced species like grasses and weeds, lantana, blackberry, privet, etc. and permanent destruction of the native ecosystem.

If left in their natural state, bushland areas are seen by many irresponsible locals as ideal places to dump old car bodies, garden waste containing exotic cuttings and other refuse.

Orchids are also decimated by commercial activities such as land clearing, grazing, agriculture and the associated use of chemical fertilisers, pesticides and fungicides, urban development, trampling and other soil compacting activities.

All these practices are increasing and will continue to increase with the population, whose demands and density are greatest in the areas of Australia in which orchids occur.

Land development and exploitation are regulated by various levels of Government. The policy of these Governments is determined by elected officials, who have to compete for re-election at regular intervals. In this climate, most decisions are taken with the intention of being popular in the short term so that re-election prospects are enhanced. Long term policies are generally given a lower priority (unless forced by popular opinion) and environmental issues have only recently been elevated to the front page as people see the obvious, rapid deterioration, mainly the result of ignorance or "quick fix" decisions of past Governments.

Opinion poll driven decisions seem to be on the increase and unfortunately, native orchids don't have a high position on the public's priority list.

It is significant that the environmental issues that generate the greatest heat (and attract most funding and political debate) are those that may be defined as "lifestyle" issues (industrial smog, aircraft noise, beach pollution, etc.) or those that are highly visible (clearfelling) to a significant voting population.

A far lower priority is given to the preservation of native flora and fauna, with the exception of a few high-profile animals. Unfortunately, the Japanese and Americans have shown no interest in cuddling a native orchid!

Long-term decisions, particularly those which tend to permanently degrade significant ecological units (freeway construction, large scale urban development, etc.) are much less likely to be based on balanced planning processes, but be driven by perceived necessity. The need for such projects generally enjoys bipartisan support and any environmental impact statement tends to be a development enabling document rather than a genuine attempt to determine environmental impact.

Political debate (often protracted) generally concentrates on implementation rather than merit of the project.

A basic weakness of the development process is that environmental statements are usually prepared by the developer.

The system is changing albeit slowly as more people become concerned as pollution and environmental degradation become more obvious.

Considering all this negative information, is there a long-term future for native orchids in N.S.W.?

Fortunately, it is not all doom and gloom.

We are lucky to have an almost unbroken strip of natural and near natural country extending from the Queensland to the Victorian border.

This strip bisects the orchid-bearing sector of the state and most is either wholly protected (National Park) or partly protected (State Forest). Apart from illegal collection and forestry activities, the substantial orchid population enjoys a degree of protection.

In the eastern and western sectors unfortunately, the same cannot be said and it is within these parts that we must be most vigilant.

I suspect that the western sector is the one where the most widespread habitat destruction has occurred.

While human population density is not comparable with the coastal sector, because of the topography, there are fewer bushland areas and huge, contiguous tracts have been modified by farming and grazing.

I also suspect that many orchid colonies have been made unviable by wide separation and destruction of specific pollinators by pesticides.

Unfortunately, this region at present contains no A.N.O.S. Groups, so research will be difficult.

It is also much larger in area than the coastal sector.

The coastal belt is also under considerable pressure, but has the advantage of more irregular topography, ensuring the retention of more areas of bushland, some of which remain relatively unaltered, Despite our best efforts to destroy them, many colonies of orchids survive, some in areas of high population density.

However, they cannot all continue without some assistance.

WHAT CAN WE DO?

How can we develop a strategy which will ensure the survival and viability of all species throughout their natural range?

While we continue to lose orchid habitat at an increasing rate, I am concerned that we don't even know what we are losing.

The classification of Australian orchids is still incomplete and the record of their distribution is even more hazy.

The number of professionals engaged in the identification of orchids and their pollinators and recording accurately their distribution and rarity is pitifully small and at the current rate, some species and/or pollinators may well become extinct before they can be identified.

Before it is possible to adequately protect all species throughout their ranges, the following information on each species is required:–

(a) Distribution, frequency and clonal variations.
(b) Germination requirements.
(c) Range of seed dispersion.
(d) Pollinating species.
(e) Requirements for survival of pollinators.
(f) Pollinator travel range.

Given the number of professionals available and allowing that this number is unlikely to increase dramatically in the future, it is imperative that A.N.O.S. co-operate with these people as closely as possible and provide them with whatever assistance we can.

I find some of the correspondence appearing in *The Orchadian* recently unhelpful, when the competence of some of these experts has been questioned. Surely we can disagree and discuss these matters in our journal without getting personal.

HOW THEN CAN A.N.O.S. BE MOST EFFECTIVE?

We have a membership in the vicinity of 1,000, most of whom are primarily interested in the culture of epiphytic species and their hybrids.

These members are, perhaps unknowingly, helping to reduce illegal wild collection by "improving" the quality of the flowers and so rendering the cultivated plant more appealing than the wild collected specimen to exhibitors and fanciers alike. The line breeding of species plants (which also provides superior parents for hybridisers) should be encouraged.

The benching of any wild collected plant should be prohibited at all A.N.O.S. shows and exhibitions.

We are fortunate to have a number of members who spend a considerable amount of their spare time observing orchids in their native habitat and a number of these are keen photographers.

Those photographers specialising in orchids may, at times observe pollinators at work. It may be of assistance if good, clear photographs could be taken of these insects on the flower. I urge you to take up the challenge and attempt to photograph them.

I again draw your attention to the A.N.O.S. Data Base Project (*The Orchadian* Vol 11, No. 5, September, 1994), which requires your participation for success. I consider this the most important and ambitious project yet attempted by A.N.O.S.

While it is necessarily a long term project, the sooner enough information is accumulated to make the data base useful, the better. The information collected will eventually satisfy requirement (a).

In the past we have spent a great deal of time preparing submissions which have been presented to development consent authorities after re-zoning or development applications have been lodged.

The only long term benefit of this strategy has been perhaps that we have made a few people aware of the existence of native orchids.

Normally, after being given a polite hearing, the submission is ignored.

I often wonder about the long term result if one of our submissions was successful and a flora reserve created.

Unless we were vigilant the reserve, surrounded by some form of development would eventually be "beautified" to the detriment of the plants it was created to protect.

We don't have the resources to maintain many reserves, so I think that if we go down this road, the location of any reserve must be selected very carefully.

We now find ourselves in the position of trying to develop a strategy before we have sufficient information to plan soundly. It will be many years before the classification of the plants and pollinators is complete.

However, I make the following suggestions:–

(i) Prepare a base map of your area and shade the areas of National Parks and Nature Reserves. This represents the secure orchid population base which can be maintained at no cost to A.N.O.S. The remaining area represents private land, unreserved public land and State Forests.
(ii) Examine the areas of State Forest and other publicly owned lands and see if the reserved lands can be linked through these parcels, including as much orchid habitat as possible.
(iii) Identify significant orchid populations on privately owned land.
(iv) Identify minor orchid concentrations and mark these on your map.
(v) Design a network of "wildlife corridors" linking the various parcels. Fortunately, seed and pollinators can travel some distance across open land, so in fact the corridors can be a series of "islands".
(vi) Decide how much of the scheme is practical and delete the rest, excluding areas which are likely to be densely developed, keeping in mind that you are developing a long term project.
(vii) Once you have what appears to you a practical, achievable project, consult with your local National Parks and Forest officers and request their input.
(viii) Commence implementation as soon a possible, **before** development starts. ✻

SPECIES CONCEPTS AND THE NEW TAXONOMY

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I do not wish to unnecessarily prolong the discussion on the "New Taxonomy", but I feel I must respond to Alick Dockrill's comments (*The Orchadian* 11(10): 472-473 (1995)). I too wish to congraulate *The Orchadian* for promoting discussion of this important issue. I should say at the outset that my previous article "In Defence of the New Taxonomy" (*The Orchadian* 11(8): 356-357 (1995)) was not a personal attack on Alick Dockrill. Rather, Alick had enunciated views held by many A.N.O.S. members and it was the message I was challenging, not the messenger.

Underlying the debate about the "new taxonomy" are some fundamentally different perceptions of the concept of "species" and the purpose of taxonomy.

SPECIES CONCEPTS

In order to discuss taxonomy we must have a clear concept of what a "species" is, otherwise people end up talking about different things, which seems to be the case at the moment. I am not at all sure how Alick Dockrill and others define a species. Their concept appears to be something like: "a species is a group of organisms that is significantly and consistently different in morphology from other such groups". Although reasonable, this definition has the inherent problem that is is subjective; what is regarded as a significant morphological difference by one person may not be so regarded by another. This problem of traditional taxonomy has led to cycles of synonymisation and resurrection of species in the past, depending on the conflicting views of different workers. This is clearly an unsatisfactory situation.

Whenever biologists have tried to rigorously define the concept of species, going back at least as far as Darwin, definitions emerge along the lines of a species being an "interbreeding population reproductively isolated from other such groups". Until recently it has not been practical or technically feasible to apply this "biological species concept" generally in taxonomy.

I has been **assumed** traditionally in taxonomy that morphologically distinct groups are equivalent to reproductively isolated groups and in many cases they are. However, new technologies such as enzyme electrophoresis and DNA fingerprinting and methods such as pollinator specificity testing, have allowed us to demonstrate reproductive isolation more easily and hence prove two populations are different biological species. This work is showing that in many groups of organisms there is much more genetic and species diversity than previously realised.

So I must disagree with Alick that the "new taxonomy" involves "a newly conceived conception of taxa". There is nothing startlingly new about the concepts involved. What is new is that they are being applied to our orchids for the first time. My designation of the recent extensive taxonomic changes in Australian orchids as the "new taxonomy" was simply a convenient way of distinguishing the recent work.

Although it is possible to prove two groups of organisms are reproductively isolated by the above methods, current Australian orchid taxonomists are still mainly applying traditional comparative morphological analysis. However, their work is imbued with a broader biological and biogeographical understanding than was available to earlier workers. I did not wish to imply in my original article that this work is not open to challenge. I have no doubt that some of the recent determinations will be modified by future workers. However, my studies on pollinators of sexually deceptive orchids strongly suggest there are likely to be more species present than the recent taxonomic work has recognised, not less.

The great value of the new technologies and methods is that they provide an independent means of identifying species and relationships and can therefore be used to validate or invalidate the morphological analysis. Essentially, these methods can signpost biological species. They allow us to sort the morphological variants into meaningful groups, so that variation within species can be distinguished from variation between species. The biologically distinct groups can then be examined morphologically to determine how they relate to currently recognised species and whether any new taxa are present. The taxonomist is able to determine which morphological features can best be used to distinguish species and to describe new ones.

There is no denying that some of these newly recognised biological species are very difficult to tell apart in the field; but most are not, once you know what to look for. To me this is part of the challenge.

In relation to the epiphytes, Alick rightly picked me up for my statement that: "there is no reason to think the situation with the epiphytes is any different". My reasoning behind the statement was not made clear. What I meant was that the recent taxonomic changes to the epiphytes were made using the same approaches to morphological analysis as for the terrestrials. My work on *Chiloglottis* pollinators has shown the new morphologically-based taxonomy to be essentially valid for that genus. Since the taxonomic approach used for the epiphytes was the same, it seems likely that most of the epiphyte work will also turn out to be valid. Whether it does or not, only time and more research will tell. However, in the meantime, I simply wished to point out there was evidence that the recent approaches to morphological analysis are sound.

THE PURPOSE OF TAXONOMY

This brings me to the purpose of taxonomy. There seem to be two conflicting views at the moment. One view sees taxonomy as a system to give species names to forms we can distinguish relatively easily. Less easily distinguished, but consistent variants might be called varieties and these can even be subdivided into forms. There is an hierarchy of names based solely on the degree of physical similarity.

The second view sees taxonomy as a system for naming biologically discrete entities with the aim of reflecting accurately the evolutionary history and relationships of the orchid family. Species defined under this approach may not always be readily identifiable. This is not a problem created by taxonomy or science; it is due to the fascinating complexity of orchid biology and our inability as humans to perceive all the factors critical to orchids. We rely almost entirely on our eyes to understand the world and appreciate orchids, because vision is our most powerful sense. Plants interact with animals via many mechanisms we cannot perceive, such as ultraviolet and infrared light, odours, tastes, etc. Orchids are particularly adept at exploiting and manipulating insects, which is the basis of their often extraordinary natural histories and diversity.

The purely morphological approach to taxonomy will always be subject to argument and interpretation. Alick has gone to some lenths to dispute the notion that there is a single correct taxonomy. I contend there is, ultimately, only one correct taxonomy, because there has been only one evolutionary history of the orchid family. Progressively, with the aid of modern approaches, the true evolutionary tree of the orchids will be pieced together. There will be some false starts along the way. The new methodologies will not necessarily provide all the answers. However, they clearly have the capacity to solve many existing problems, thereby raising our understanding another level or two. With this will come a new set of problems, but at a much finer resolution than at present.

Finally, I must take exception to Alick's concluding remark that the "new taxonomists" are "obsessed with finding new species". This is simply not true. The quest is for understanding; to understand the diversity of Australian orchids, their biology, origins and history. The first and most fundamental step in this is to understand the variation; to identify the biologically distinct species. It is only with this understanding that sensible decisions can be made about orchid conservation, management and research. In the process our heightened comprehension will greatly enhance our enjoyment of this marvellous group of plants. ✽

LETTER TO THE EDITOR —
Orchid Taxonomy what names should we use?

I pity the editor. Caught in the middle of a crossfire that looks like it came from the set of a Sylvester Stallone movie! However I take pen to paper yet again to ask you not to run up the white flag just yet. I do not believe the debate on names is anything like over yet, nor do I believe it is necessarily a bad thing. It makes people think and that can't be all bad. To help keep the bullets flying, I will put my point of view on which names I think we should use. But first my interpretation of the situation.

What we are witnessing with orchid taxonomy is the dichotomy between a system of names which attempts to exactly reflect evolutionary history of the group and one which is useful to the botanical public. The time when both can be combined into one system may have run its course. What use is a system where one has to catch the pollinator before one can be sure of the species of *Caladenia* one is looking at? If *Caladenia, Pterostylis* or *Diuris* species can only be identified by sending them to Canberra, what are field botanists and ecologists to do? I do not think we should yet abandon a useful system of names and I question whether we are really anywhere near the goal of accurately reflecting evolution in our systems. I suspect that we are still so far from the truth that we are throwing out the baby with the bathwater if we abandon a practical, useful system to try to achieve the goal of a perfect phylogenetic system.

It seems that taxonomic categories are about to gain a promotion — today's varieties and forms are tomorrow's species; today's species are tomorrow's genera and so on. As I think I said once before, I believe that the species should be a useful level of classification and that in most cases a competent amateur botanist armed with a good field guide, a magnifying glass or a stereo microscope in some cases, should be able to identify species without sending them to a central point. Sure there will be exceptions, but this should apply in most cases.

If there is all this wonderful new scientific information available then why can't we apply it at the subspecific level and leave the species reasonably stable? In that way we keep all the new information and also keep the familiar species. For example we have *Dendrobium speciosum* var. *curvicaule* not *D. curvicaule*. In any case I really wonder how much of this "gee whiz" technical information is available, what it really means and how reliable it is. I am sure it is available in less than one per cent of cases and in the rest it is guesswork and inference — which is what taxonomy has always been. Where such information is available certainly it should be used in taxonomy, but we must be wary of extrapolating from one group to another without direct evidence. I believe that the species category is totally a figment of human's imagination and that it works in some cases and fails in others. Furthermore species are different entities in different groups and for this reason I do not think it matters if we recognise species at different levels in *Caladenia* and *Dendrobium*.

In your "Talking Point" you say that name changes are accepted until someone produces a good case against them. Well, I believe that Alick Dockrill has done just that for most of the tribes of orchids in Australia. Therefore I would like to propose that *The Orchadian* sets a lead by following the nomenclature of Alick Dockrill in his revised *Australian Indigenous Orchids*. Here we have a published alternative classification to virtually all the Australian orchids with the exception of the tribe Diurideae. This should not be taken to say that I agree totally with everything that Alick has done — in fact I disagree on several issues, but it is up to me to publish on these if I want to have my point of view accepted. However I do agree with the vast majority of what is in Alick's book.

With respect to the Diurideae, I suspect that many of these hundreds of new species are based on trivial differences, but I have no evidence on this and I have no alternative than to accept them. Therefore I propose that the names proposed by Jones and Clements be followed until such time as an acceptable revision is published.

Dr. P. S. Lavarack
Department of Environment and Heritage

SHOW REPORTS

SYDNEY GROUP SPRING SHOW

David Butler, Hornsby

A.N.O.S. Sydney Group Inc. held their 13th Annual Spring Show over the weekend 9th–10th September in the Baulkham Hills Community Centre and despite the ominous "13" tag, visitors were again treated to a feast of top quality native orchids. Weather conditions prior to the show — very high temperatures followed by cold, cold days and nights — resulted in fewer than usual plants being benched. However, the increasing maturity of many show plants, together with a floor display, wall mounted specimen plants and brimming sales table combined to give a hall full of colour and perfume.

A highlight of the weekend must certainly have been the third of the Don Barnham series of lectures. On this occasion Sydney Group was privileged to host Mark Clements who explained the thinking and investigative work which resulted in many name changes affecting our native orchids. A most enlightening and timely talk which laid many of the present apprehensions to rest, but as Mark says: "There's more!"

The terrestrial classes contained some real charmers including *Caladenia catenata,* grown to perfection by Bill Kennewell, tall stems supporting flowers of a glowing hot pink colour with contrasting green columns. But colour is not everything and nearby a pot of stately *C. eminens* (Plate 52) exhibited by Doug Binns was judged Champion Species Orchid of the Show. From Western Australia, these "spider orchids" have been carefully nutured by Doug for 10 years increasing in that time from the original two plants to the present six and this is the first year with a double flowered plant.

Champion Specimen Species went to Roger Philips *Dendrobium fairfaxii* 'Big Roger' (Plate 46), the plant and large perfumed flowers cascading down the wall in greeting to visitors entering the hall.

Gerry Walsh once again proved his expertise with *Sarcochilus falcatus,* this time with two floriferous beauties. There is something particularly appealing about well grown *S. falcatus.*

Dendrobium kingianum was shown in a range of colours, but of special note was Henk van den Berg's flowering of *D. kingianum* 'Steve' AD/ANOS, the flowers being well displayed on firm upright racemes. Quite a change from the usual lax habit of raceme and allowing this rather uniquely coloured *D. kingianum* to be seen to good advantage. Also this flowering of 'Steve' was far more colourful than seen previously at Sydney Group. Let us hope that Henk passes on his secrets!

The showing of *D. speciosum* was very good considering the indifferent weather and "off year". Three plants of *D. speciosum* 'Charlie' AM/OSNSW took out the trifecta but not without some tough competition. Although it has been around a long time 'Charlie' is certainly still a consistently good performer on the showbench.

Champion Hybrid was awarded to *D.* Yondi Tina 'Goliath' (Plate 48) benched by Bernie Fletcher, a plant which only flowered for the first time two years ago but which has once again raised the benchmark in yellow flowered hybrids. It only needed the one raceme of 17 flowers to immediately capture everyone's attention, each flower being a large filled in "star" of a particularly desirable golden colour, held on a graceful arching raceme.

Alan Ferrie took out Champion Specimen Hybrid with his magnificent *D.* Yondi Sparkle 'Elizabeth' (Plate 47). Nine racemes of heavy textured yellow flowers were evenly distributed on a well grown plant — a worthy winner and a plant we will see more of.

This year the Patron's Prize went to the Best Terete Leaf Exhibit and the fortunate winner was Michael Harrison with *D.*

Rosemary Jupp, a large flowered pencil orchid of a particularly eye catching colour form. Yellow/burgundy striping on the sepals and petals was offset by a contrasting white labellum, the whole effect of "falling" foliage and flowers making a most attractive sight.

Sid Batchelor, as well as being hybridiser of many of the top plants on display, benched a beautiful *D.* Bardo Rose X *D.* Hastings and a *D.* Kathryn Banks X *D. falcorostrum*. Their flowers in lovely shades of pinks and mauves provided a delicate contrast to the profusion of yellows benched nearby.

Proud growers and first time winners Ron and Lee Formby fittingly won the Best First Flowering Seedling class with *D.* Elegant Heart 'Neville', a stunning concolour pale yellow "hot-cold". Their smiles lasted the whole weekend!

Another happy grower who can't stop grinning is Karl Puhlman. *Sarcochilus* Pinky 'Sprite' X *S. hartmannii* 'Kerri' did the trick for Karl who now joins the winners' ranks. The number of Sarcanthinae hybrids benched in Spring Shows is increasing at a rapid pace, thus bringing an awareness of these dainty orchids to many more people.

Darryl Smedley's plant of *Dendrobium cuthbertsonii* was a worthy "non-Australian" winner — nine glowing red flowers on a dainty plant. More and more of the Australasian orchids will be seen as Darryl and others "spread the word" and people start to realise these gems are relatively easy to grow.

All in all this 13th annual show was a great success bringing together seasoned enthusiasts and those newly caught up in the spell woven by our wonderful native orchids.

WOLLONGONG & DISTRICT NATIVE ORCHID SOCIETY 18th ANNUAL SPRING SHOW REPORT

Bruce Porter

Our spring show was held in conjunction with the annual floral festival (Florawarra) at the Wollongong Botanic Garden. This year the Botanic Garden was celebrating its 25th birthday.

Thankfully, for the first time in several years our large marquee did not blow down the night before the show.

Despite an unusual growing season we had 362 entries overall and a pleasingly large number were in the junior section.

Champion Hybrid and Grand Champion went to *D.* Star of Riverdene owned by Bruce Porter. Champion species was exhibited by Bob and Helen Morton and was a very nice form of *D. striolatum*. Bob already has plans to go one better with this plant at next year's show.

The other major prize winners were:–

- Champion Australasian Species or Hybrid — *D.* Gwen Slade exhibited by Ron Wheeldon.
- Peter Gough Memorial Trophy for Best *Sarcochilus falcatus* — Alan Stephenson.
- Ken Russell Perpetual Trophy for Best *Dendrobium* Seedling Species (first flowering) — *D. kingianum* Cream 69 X *D. kingianum* Cream 69 'White Ice', Ron Wheeldon.
- Best Cultured Plant — *Bulbophyllum wadsworthii*, Ron Wheeldon.
- Best Seedling (first flowering) (excluding *Dendrobium* species) — *Parachilus* Perky, Albie and Thelma King.

There were many other interesting plants in the 45 individual sections and most exhibitors were rewarded with recongition by the judges or by the many admiring comments from the visitors to the gardens.

A.N.O.S. VICTORIAN GROUP 1995 SPRING SHOW REPORT

Greg Hall

Our spring show was once again held at the Holmesglen College of Tafe, Waverley Campus and the ample space at this venue was well utilised, with separate areas for our display and sales plants.

Plenty of helpers were available to set up on Friday and the displays took shape very quickly as we followed Show Convenor Warwick Gill's clear and concise floor plan.

Brenda Edmonds and Nita Sharp provided good publicity for our show with several reports appearing in gardening magazines and local newspapers and we even scored a slot on TV. This ensured an excellent attendance and one visitor commented that she ". . . happened to hear the lady on the radio and just had to come along and see". Well done, Dorothy!

A burst of warm weather in August resulted in an early flowering of many members' plants. This, unfortunately, restricted the display of epiphytes (especially hybrids) but there were still a good number of species epiphytes represented, including a small display from Papua New Guinea. The species that dominated the show was *Dendrobium speciosum* and almost every possible variation of flower shape, size and colour of this "King of Orchids" was on display. The magnificent *D. speciosum* var. *grandiflorum* (Plate 53) grown by our President, Murray Harding, greeted visitors at the entrance with its masses of deep yellow blooms and this eye-catching plant took out the Bill Murdoch Prize for Best Cultivated Epiphyte. The warm, humid weather (especially on Sunday) ensured that the display hall was engulfed by perfume (to the angst of some). The many colour variations, from deep magenta to pure white, was well represented by the stands of *D. kingianum* as were the pastel pinks and white of *D. Xdelicatum.*

A suggestion to use extra lighting to induce the Thelymitras to open certainly paid off and early sales of this genus was "proof of the pudding". The salmon pink *Thelymitra* Kay Nesbitt, lemon yellow *T. antennifera* and sky blue *T. nuda* were showing no sign of stage fright under the bright lights and Helen Richards' many flowered pot of *T.* X*chasmogama* (Plate 67) unabashedly took the prize for Best Cultivated Hybrid.

The plentiful pots of *Pterostylis* X*ingens* and the huge *P. baptistii* (tawny frogmouths on stems) were all picture perfect and the *Caladenia patersonii* (Plate 54), a three dimensional work of art grown by Malcolm Thomas, won the Phil Mims prize of Best Cultivated Terrestrial. The spectacular *C. splendens* (Manuscript name) dwarfed all other caladenias and one visitor was overheard saying she was trying to see ". . . the strings that were holding the shopper up!"

The Spot Raffle experts (Helen, Dorothy, Alex and Gael) had no trouble selling tickets with, at times, some visitors queueing to buy. The plants for the raffles were selected from the sales tables and if they had not been adorned with a "sold" sticker, there is not doubt that they would have been snapped up very quickly.

Potting displays of both terrestrials and epiphytes were provided by several members and it seemed that whenever Stan Hill wasn't performing a demonstration he was helping someone carry a newly purchased bag of bark to their car.

Much enthusiasm was shown by all members who gave their time to help. Thanks folks!

CHARITY FESTIVAL OF AUSTRALIAN NATIVE ORCHIDS

Sunday, 1st October, 1995

Eric Wilde
15 William Road, Little River, Vic. 3211

It is very hard when you have been bitten by the "orchid bug", to stay at home when you know there is a show on in a place warmer than Victoria was in September/October. The place that called us away was Dayboro. We can grow Aussie natives down south quite well, but it is always great to see how someone else does it.

We booked our flight and arrived on Friday, 29th September and made a detour through Mt Tamborine to visit Ted and Barbara Gregory's nursery — we had timed that just right as we were met by a beautiful display of their Aussie natives in full bloom and as we found out, some of them were going to the show at Dayboro on the Sunday.

One of them was a *Bulbophyllum braceatum* (Plate 50) and it eventually received Reserve Champion of the Show — this was a well-grown specimen growing underneath their benches in a relatively open area.

Their big dishes of *Dendrobium kingianum* 'Tungsted's Pink' and *D. kingianum* 'Minnie' also received first place as did their *Sarcochilus hartmannii* Boonah.

A beautiful specimen of *S. spathulatus* (Plate 49) owned by Stewart and Helen Penman was a worthy recipient of Grand Champion of the Show — if only we had taken the right lens for the camera the photo would have done it justice.

Frank and Bev Simpson have to be congratulated on the organisation that goes into putting on this "All Aussie Native" show. This year the number of plants exhibited was up on lasts year's inaugural show and one would expect that it will grow bigger in years to come.

There was a great selection of *Sarcochilus* exhibited, one of Frank and Bev's orchids, a *S.* Peach Spots (Plate 51) was an impressive apricot/pink colour, covered in spots. *S.* Weinhart 'Moonlight' — which received for its owner Ken Russell a first place was a perfectly shaped flower with pale yellow spots. Ken also received first and second places in Best Three Hybrids Any Combination.

Another outstanding orchid was a *Plectochilus* Kilgra — clear green in colour and growing beautifully for its owner K. Scanes.

Not to be outdone, the dendrobiums were just as eye catching, especially the two *Dendrobium canaliculatum* owned by B. and C. Anderson who received first and second for them in their class.

We enjoyed our weekend immensely and of course to remember our weekend, a lot of new orchids found their way back home with us, but most of all the people we met made us feel very welcome. We hope to meet up with them again next year.

REPORT ON THE NATIVE ORCHID ASPECT OF THE SOUTH-WEST REGIONAL SHOW & CONFERENCE HELD IN CANBERRA, OCTOBER, 1995

Sheila Cudmore, Canberra

Over the long weekend Canberra was host to orchids and growers from W.A., Queensland, Victoria, N.S.W. and South Australia, a friendly frog from the Kangaroo Valley who travelled up with orchids from Orchid Images and well behaved dog "Piper" who came with Jodi's Orchids.

Four 2m x 2m displays of orchids were arranged by Albury/Wodonga, Wagga Wagga, Sapphire Coast and Canberra and a table top display by John Ryan and Murray Smith of Canberra. Many more orchids were benched. Most of the orchids in the show, native and exotics, had been grown in severe climatic conditions, wet winters with some degree of frost and hot dry summers and a lot of electricity bills for orchid comfort.

The displays and benches contained many native orchids especially *Sarcochilus,* the champion Australian native was *S. hartmannii* owned by Les Lincoln of Canberra. The plant possessed 13 racemes of sparkling white flowers. Another interesting Canberra *Sarcochilus* was *Parachilus* Frances X *Sarcochilus fitzgeraldii* (Plate 55), a dark red owned by Murray Smith. This was in the table top display, which contained varieties of *Dendrobium kingianum* and hybrids and other species. A dark pink *Sarcochilus ceciliae,* owned by Norma Stafford helped decorate the

Sapphire Coast display. Wagga had a delightful *S. falcatus* in their display and one of our excellent lecturers, Walter Upton, gave an interesting and topical paper on *Sarcochilus* hybridising.

Many dendrobiums also made an appearance — two specimen plants were very impressive, *Dendrobium gracilicaule* (Plate 56), which had been owned for 12 years by Terry Morrissey of Orchid Images and *D.* Telekon, a dark floriferous *D. kingianum* hybrid which decorated the Albury/Wodonga display and had been owned for eight years by Geoff Milton. There were also two more beautiful dark "kingianums" in this display, *D. kingianum* 'Harry' X *D. kingianum* 'Murray' and *D. kingianum* 'Karl Marx' X *D. kingianum* 'Merellen No. 1'.

Champion specimen orchid was *D. linguiforme* owned by Dave Ramsay of Wagga Wagga and Best Orchid Benched by a Novice Club Member was *D.* Peter X *D. kingianum* owned by Kathleen Seeuwen of Canberra. Best Australian Native Seedling was *D.* Brinawa Charm X *D. speciosum* owned by P. and J. Grech of Albury/Wodonga. Incidentally, this plant was registered as *D.* Barry Simpson on 6-1-1995.

The only *D. speciosum* in the show was in the Wagga Wagga display and the only *Phaius tankervilliae* was in the Canberra display. Pots of *Pterostylis pedunculata* on the benches and *P. baptistii* in the Sapphire Coast display won first and second in the Terrestrial section.

Two walks on Black Mountain in the heart of Canberra were also part of the orchid weekend. Mark Clements, another of our excellent lecturers, had informed delegates that what we know as *Caladenia carnea* is really *C. fuscata* (the orchid on our Society badge) and *C. dilatata* is now renamed *C. tentaculata.* Both these orchids were flowering for the walkers together with *C. caerulea,* plenty of mauve *Glossodia major* and three white *G. major* (Plate 60) which delegates unfortunately missed (they could have been in bud, but I thought it worth mentioning and showing a photograph of them as they are not in flower every year) were found at the side of the path just before the swampy area where the buds of a sun orchid were growing (I went up the day afterwards to take photographs). Further up the walk the "beards" *(Calochilus robertsonii)* (Plate 61) were flowering, also *Pterostylis aciculiformis.* Coming back along the main path, *Pt. mutica* were found on the edge of a small creek and *Diuris semilunulata* were flowering in several areas on the walk. Delegates were also fortunate enough to be taken on a tour of the glasshouses courtesy of the Australian National Botanic Gardens.

On Saturday night delegates and members attended a very tasty dinner — especially the liqueur-laced dessert cake! — at the Italo-Australian Club where Freeman Peter Cudmore of Rostrum (my husband) gave a humorous tongue-in-cheek speech on being a non-orchid grower' which had everyone laughing from beginning to end.

I must point out that these were my impressions of the weekend. There were many more beautiful native orchids in the show, which we enjoyed seeing here.

A.N.O.S. PORT HACKING GROUP 4th ANNUAL SARCANTHINAE SHOW

Bob Napier

The Group's 1995 Sarcanthinae Show was held at Heathcote on 29th October and in spite of the difficult season, we had 202 entries compared with 160 for the Spring Show.

The standard of entries seemed particularly high and to my mind, better than last years. Neville Roper led the count with 59 entries followed closely by Ken Russell and Kevin Wilson, with Dennis Wood and Col Brandon equal fourth.

Ken Russell dominated the list of certificates issued, but Grand Champion and Champion Hybrid was Dennis Wood's *Sarcochilus* Melody 'Red Edge' (Plate 58). Col Brandon scored Champion Species with his *S. hartmannii* 'BK' X 'Red Snow' and Neville Roper's seedling *S.* Star Struck (Plate 59) took best in class and was awarded a well-deserved AD/ANOS. Kevin Wilson's entries had their usual success with his *S.* Melba 'Patrick M' one to watch in the future. George Barrett's *S. ceciliae* X *S. roseus* caused some discussion; even some judges feeling that it could have been included in the Other Sarcanthinae Species Class and ensured its gaining a first. Apart from the Juniors (see below) the only others on the prize list were Ken Shardlow (Best Terrestrial) and seconds to Dave Curry and Bob Napier.

The Junior Section (one class) was dominated by Katrina Parker with first and third — awarded by the judges even though there were no thirds on the schedule and Ben Curry second. Ben had the foresight to move his two dendrobiums into the Novice *Dendrobium* class and cleaned up, as had Daniel Parker with his *Sarcochilus hartmannii* and sister Katrina (second) in the Novice Sarcanthinae class. So for the year, Ben Curry is ahead with the Parkers, Katrina, Robert and Daniel, level-pegging except for that mysterious third place.

Apart from the storm which broke as we were setting up and the chablis with gourmet hamburgers from the takeaway on the highway, my memory is Ken Russell's *S.* Pinkhart X *Parachilus* Riverdene (Plate 57) which was unlucky to share the same class as Dennis Wood's *S.* Melody; was in my view, the pick of the show.

Dave Curry ran the sales bench, Janet Napier sold raffle tickets and sold A.N.O.S. merchandise, both ensuring a financial success.

Judging was carried out by Darryl Smedley, Jim Lykos, Ron Wheeldon, Jim Bailey, Syd Batchelor, Erhart Husted, with associates Bruce Murray, Ken Jackson and Ross Sadlier. Their dedication in attending and judging our shows is most appreciated and contributes a great deal to their success.

A.N.O.S. SYDNEY GROUP 11th ANNUAL SARCANTHINAE SHOW

Roger Phillips
42 Lockyer Avenue
Werrington, N.S.W. 2747

The forecast was for an overcast/wet day, but who takes much notice of the weather forecast, nine times out of 10 they are wrong. The date was the 22nd October, 1995 the A.N.O.S. Sydney Group was to hold its Annual Sarcanthinae Show at the Baulkham Hills Community Centre. By this time of the year the silly season is about at its end. With the car loaded with plants its off to the show, the trip was shrouded in mist usually a sign of a good day to follow. With the benching complete and judging about to start a last look around at the plants one would notice that the earlier warm weather had a lot to do with flowering this year.

Although plant numbers were down the members that did exhibit put on an excellent display. The Sarcanthinae section was well represented this year with seven healthy plants of *Phalaenopsis amabilis.* It was good to see some plants of *Rhinerrhiza divitiflora* benched as it is not often seen at shows, Mike Harrison's plant displayed two magnificent racemes of numerous golden flowers. In the Other *Sarcochilus* section there were a few plants of *S. falcatus,* the plant that stood out from the rest was a plant owned by Gerry Walsh, this plant was in pristine condition, it displayed four racemes each holding eight large white flowers with just a touch of golden yellow on the sides of the labellum.

The hybrid sections where well represented, a very mature plant of *S.* Zillie 'Billy' owned by Rod and Sue Nelson displayed 17 racemes each holding 15 pink/purple flowers. Mike Harrison's plant of *S.* Colonial Rose is always a plant worth a second look as the flowers are of

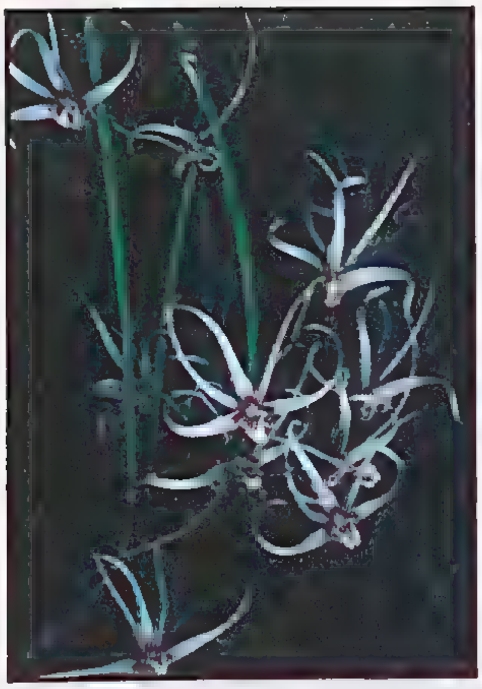

Plate 46: *Dendrobium fairfaxii* 'Big Roger'. Photo: D. Titmuss.

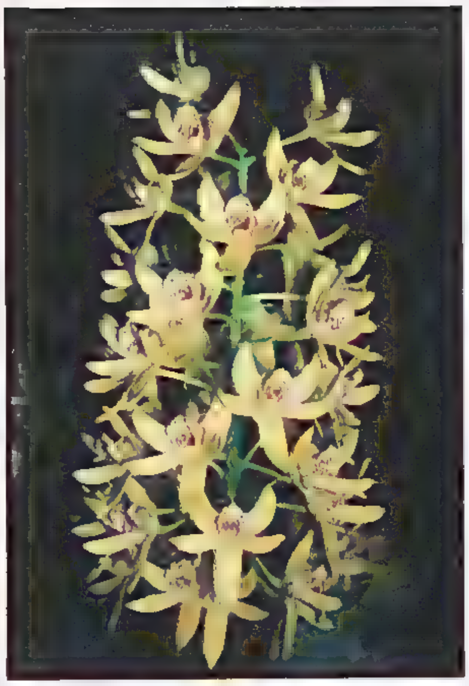

Plate 47: *Dendrobium* Yondi Sparkle 'Elizabeth'. Photo: D. Titmuss.

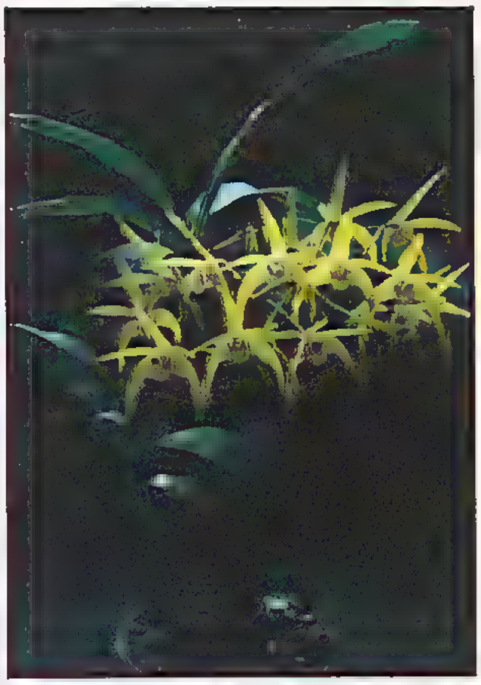

Plate 48: *Dendrobium* Yondi Tina 'Goliath'. Photo: D. Titmuss.

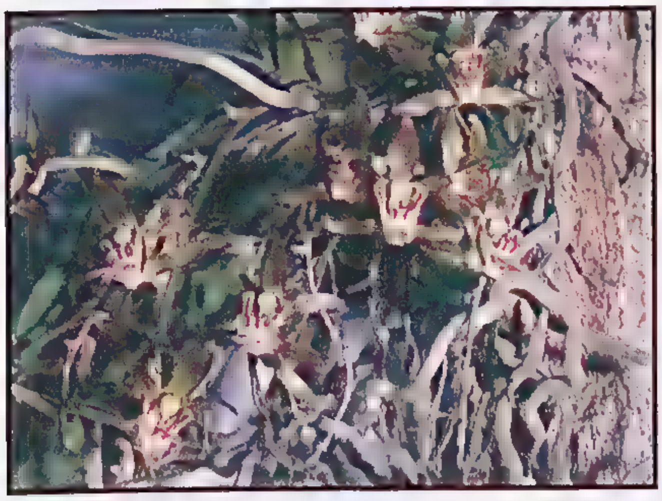

Plate 49: *Sarcochilus spathulatus*. Photo: E. Wilde.

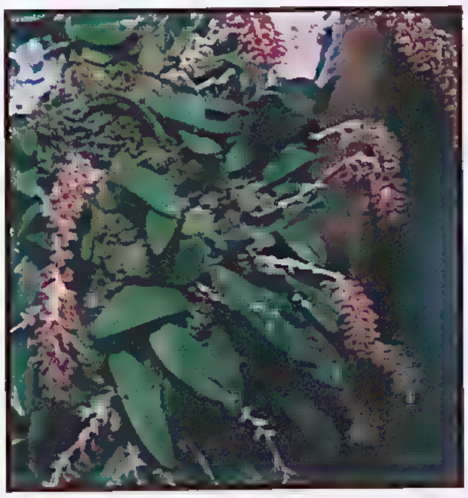

Plate 50: *Bulbophyllum bracteatum*. Photo: E. Wilde.

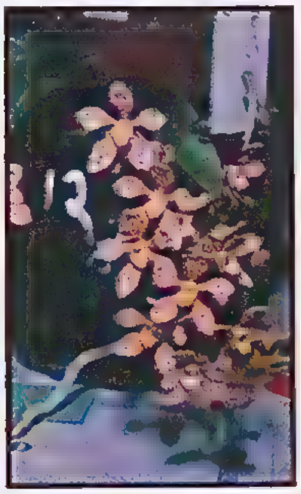

Plate 51: *Sarcochilus* Peach Spots. Photo: E. Wilde.

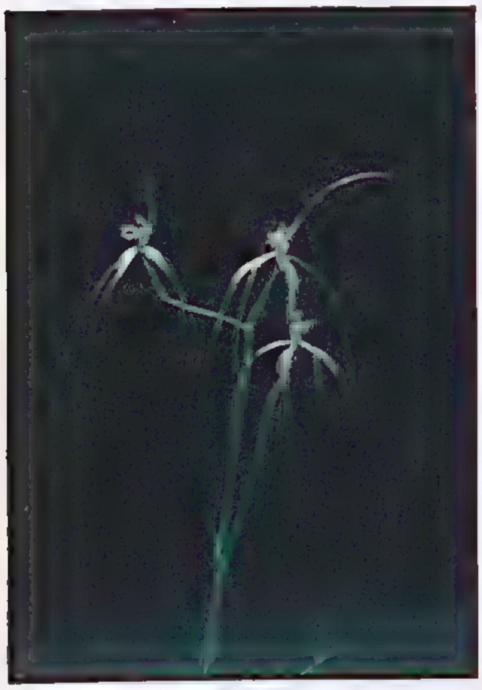

Plate 52: *Caladenia eminens*. Photo: D. Titmuss.

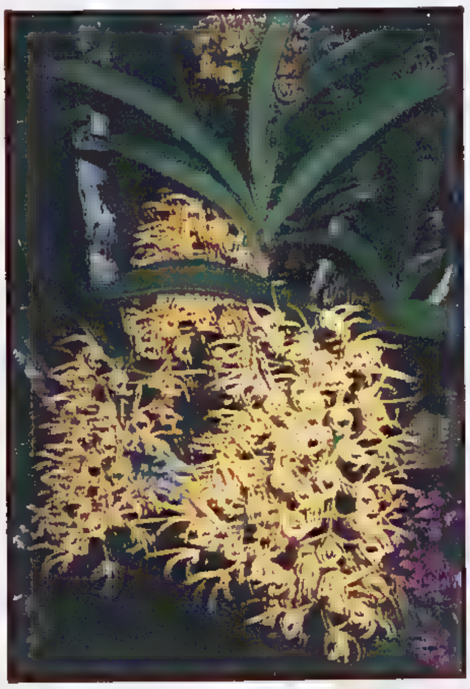

Plate 53: *Dendrobium speciosum* var. *grandiflorum*. Photo: L. Peggie.

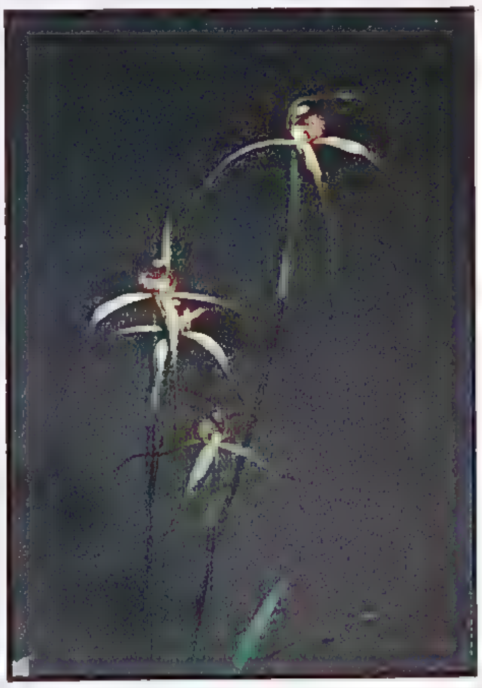

Plate 54: *Caladenia patersonii*. Photo: L. Peggie.

a orange/rust colour, although still only a small plant in comparison to some other plants it will be somthing to see in years to come.

The Champion Species went to Gerry Walsh for his plant of *S. falcatus* (Plate 64) a very well grown plant. Champion Hybrid went to Bill Kennewell for his plant of *S.* Judith (Plates 44 & 45). Bill's plant produced four racemes with an overall flower count of 57 well proportion flowers. Champion Specimen went to Roger Phillips for his plant of *Phalaenopsis amabilis* var. *rosenstromii* 'Moonshine' X Self, this plant displayed 40 large white flowers on five branched racemes. This plant was named *P.* var. *rosenstromii* 'Sharon' (Plate 65) and later received an ACC/ANOS.

Overall the day was a great success, a chance to catch up with a few people you only see in the spring, a time to enjoy being with friends. Sydney Group members can pat themselves on the back for putting on such a good display for the visitors that braved the unpredictable weather.

4th SARCOCHILUS FESTIVAL OF VICTORIA

11-12th November, 1995

Frances Wilde
15 William Road, Little River, Vic. 3211

What a glorious weekend it was for our 4th festival of *Sarcochilus*. This year the festival was held in our club rooms to encourage more orchid growers to enter and they did.

It was an open show for anyone that grew *Sarcochilus* and we had entries from near and far, including members from the Victorian A.N.O.S. Group, Mornington Orchid Society and Melbourne Eastern Orchid Club. They all did well, some winning ribbons and sashes, as well as admiration from their peers and the adoring public.

The plant that won the coveted title of Champion *Sarcochilus* of Victoria as well as Champion Species was *S. hartmannii* 'Sylvan Son' (Plate 62) owned by Howard Tozer of Barkers Creek (near Castlemaine). This plant, a sibling of *S. hartmannii* 'Sylvanvale', also received an HCC with 78 points.

Champion Hybrid *Sarcochilus* was a *S.* Judith 'Snowball' HCC (Plate 63) owners Eric and Frances Wilde and bred by Ken Russell. Ken and his wife Noelene were also in town for the show.

There seems to be a lot of *S.* Star Struck around this year flowering for the first time and one of these seedlings won our Best Seedling flowering for the first time — owners were Bill and Marion Scott, it was a beautiful bright pink with two racemes and has the potential to develop into an outstanding plant in years to come.

Best *Sarcochilus* Stand was won by Kevin Cummins from Geelong, who can grow these plants to perfection. He had both a *S.* Fitzhart and a *S. hartmannii* awarded during the last flowering season. I couldn't fail to mention a stand full of little *S.* Kate and *S.* Wilde Rose beautifully displayed by owners and breeders of these — Jim and Margo Lattimore. This display was a sea of pink of various shades and won for them a trophy.

In our general benching section, an exceptional plant of *Dendrobium* Eureka won for its owners Peter and Sheryl Adams, Champion Australian Native. A junior entrant Matthew Sobey of "Skydancers" Castlemaine won the Roy Ritchie trophy with a well grown plant of *Sarcochilus hartmannii* displaying one very nice raceme of flowers.

Overall our Show Committee were extremely happy with the response we got — over 300 *Sarcochilus* were entered for competition and another 350 orchids in the general benching. This show which ran over two days had our members run off their feet keeping up with advice on culture and care of these beautiful little Australian orchids.

Look out next year for the 5th Festival — if you didn't participate this year, make sure you do next year for it will be bigger and better than ever . . . same venue, same time — second weekend in November. ✾

BOOK REVIEW

NATIVE ORCHIDS OF BELIZE
By I. McLeish, N. R. Pearce and B. R. Adams.
Published by A. A. Balkema, P.O. Box 1675, 3000 BR Rotterdam, Netherlands (Fax: +31.10.4135947).
Hardcover — 285mm x 205mm, 278 pages. 237 superb colour plates; 120 excellent line drawings.
ISBN 90 5410 609 3
$US95.00.

Native Orchids of Belize covers, for the first time, all the orchid species ever recorded in Belize (formerly British Honduras). Belize is part of the Yucatan Peninsula in Central America and faces the Caribbean Sea.

Although this is one of the smaller countries (about one third the size of Tasmania) its orchid flora is extremely rich and diverse. 275 species in 92 different genera. Over 25% of them are commonly known to us in our collections in Australia and many more in specialist collections. Such wellknown species as *Arpophyllum giganteum, Brassavola cucullata, B. nodosa, Brassia caudata, B. maculata, Cattleya bowringiana, Chysis bractescens, Cycnoches ventricosum, Encyclia alata, E. radiata, Epidendrum ciliare, Lycaste aromatica, Oncidium spacelatum, Rhyncholaelia digbyana, R. glauca, Sobralia macrantha* and many more.

The book begins with an excellent introduction which gives a very detailed description of Belize, its position and physical geography with particular stress on its vegetation.

This is followed by Chapter 2, "Classification and Key to Genera". Bob Dressler's classification (1993) is followed and the key is based on that used by him. It is easy to follow and quickly keys out to the genus one is seeking.

Chapter 3, "Species Descriptions" is the meat of the book. The order is Tribe, Subtribe, Genus, Species: a glance through the Table of Contents will disclose the genus required. Where more than one species is involved in a particular genus, an easily understandable key is given to help identify the individual species.

Each genus is amply described together with its etymology. The treatment of each species is good — name, synonymy, description, general distribution, distribution in Belize, habitat, flowering season and how long in flower and etymology.

The superb colour plates, which include many habitat shots, are distributed throughout the work and within easy reach of the corresponding text.

Chapter 4 comprises a checklist of Belize orchids. In a fold inside the back cover is a large map of the vegetation types, rainfall and heights in Belize.

I consider this a good flora and well worthy of a place on any enthusiast's bookshelf particularly as so many of the species are of great horticultural appeal.

Walter T. Upton ✾

UPDATE ON *TRICHODERMA*

Alan Merriman
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Phone: (047) 39-5141

Sometime ago I wrote on the use of *trichoderma* in controlling fungal diseases in orchids. Since then many growers have used the products with varying success.

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So far most of the work has only been done on grapes. ABBOTT AUSTRALIA, at present, only have plans to register its use for *Botrytis cinerea* on grapes. Later on they may include ornamentals on the label.

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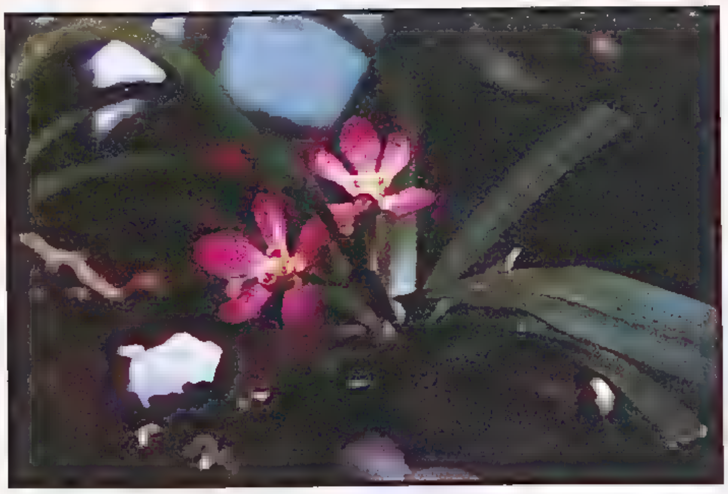


Plate 55: *Parachilus* Frances X *Sarcochilus fitzgeraldii.* Photo: S. Cudmore.

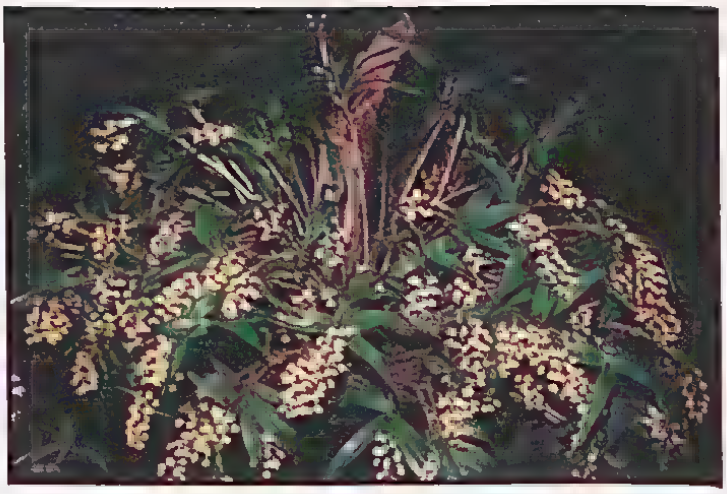


Plate 56: *Dendrobium gracilicaule.* Photo: S. Cudmore.

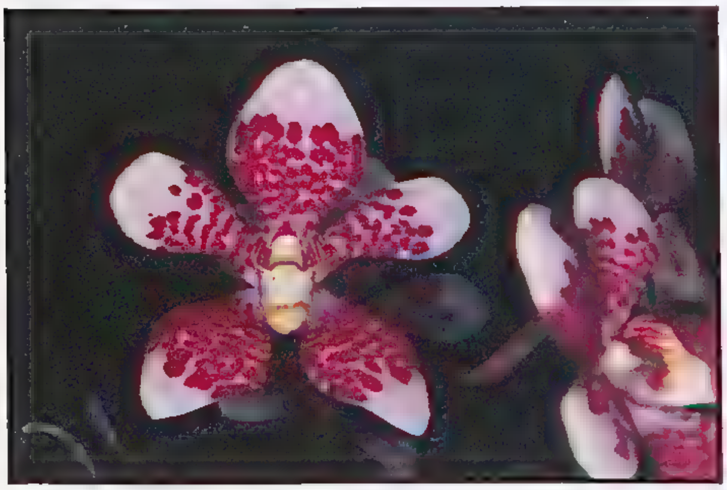


Plate 57: *Parachilus* Bobby Dazzler. Photo: R. Napier.

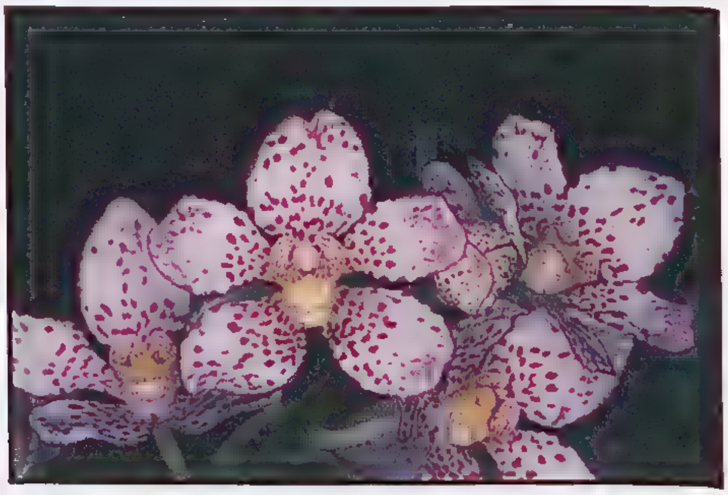


Plate 58: *Sarcochilus* Melody 'Red Edge'. Photo: R. Napier.

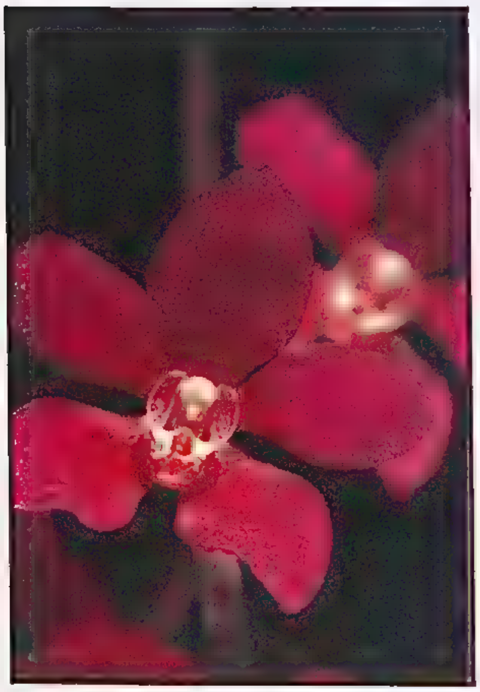


Plate 59: *Sarcochilus* Star Struck. Photo: R. Napier.

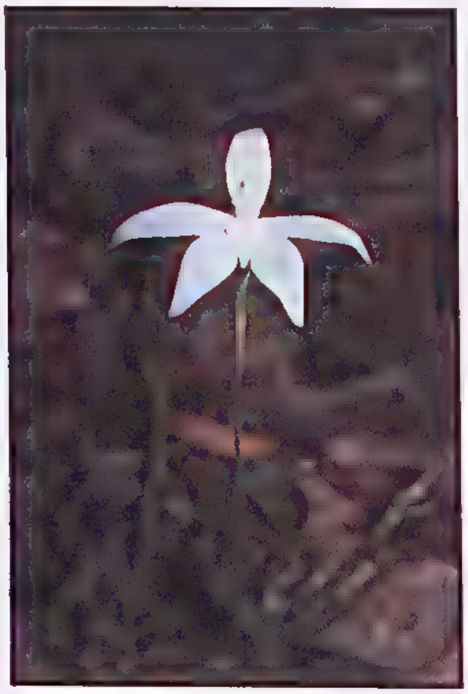


Plate 60: *Glossodia major* 'Alba Form'. Photo: S. Cudmore.

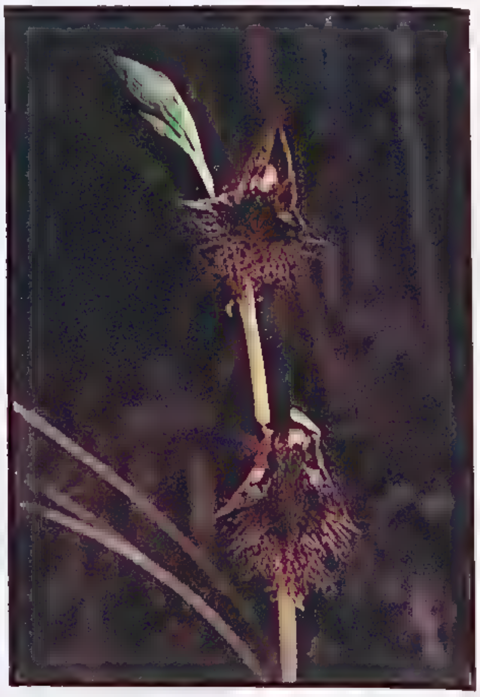


Plate 61: *Calochilus robertsonii.* Photo: S. Cudmore.

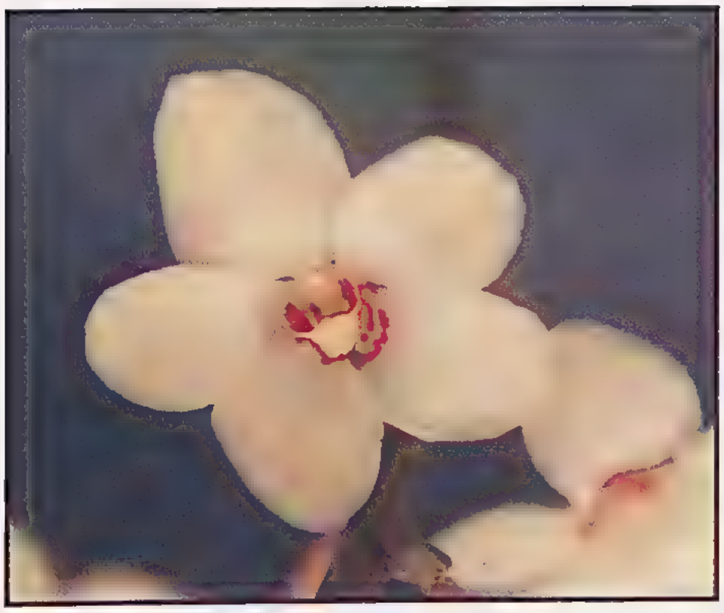


Plate 62: *Sarcochilus hartmannii* 'Sylvan Son'. Photo: F. Wilde.

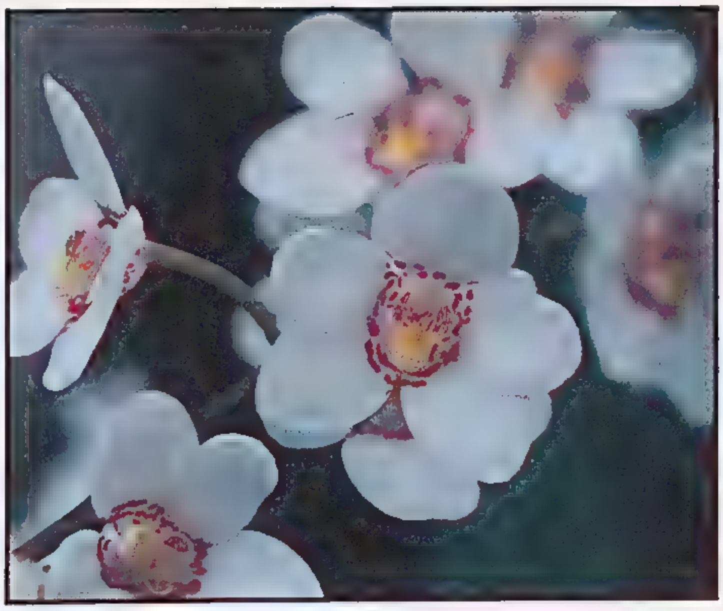


Plate 63: *Sarcochilus* Judith 'Snowball'. Photo: F. Wilde.

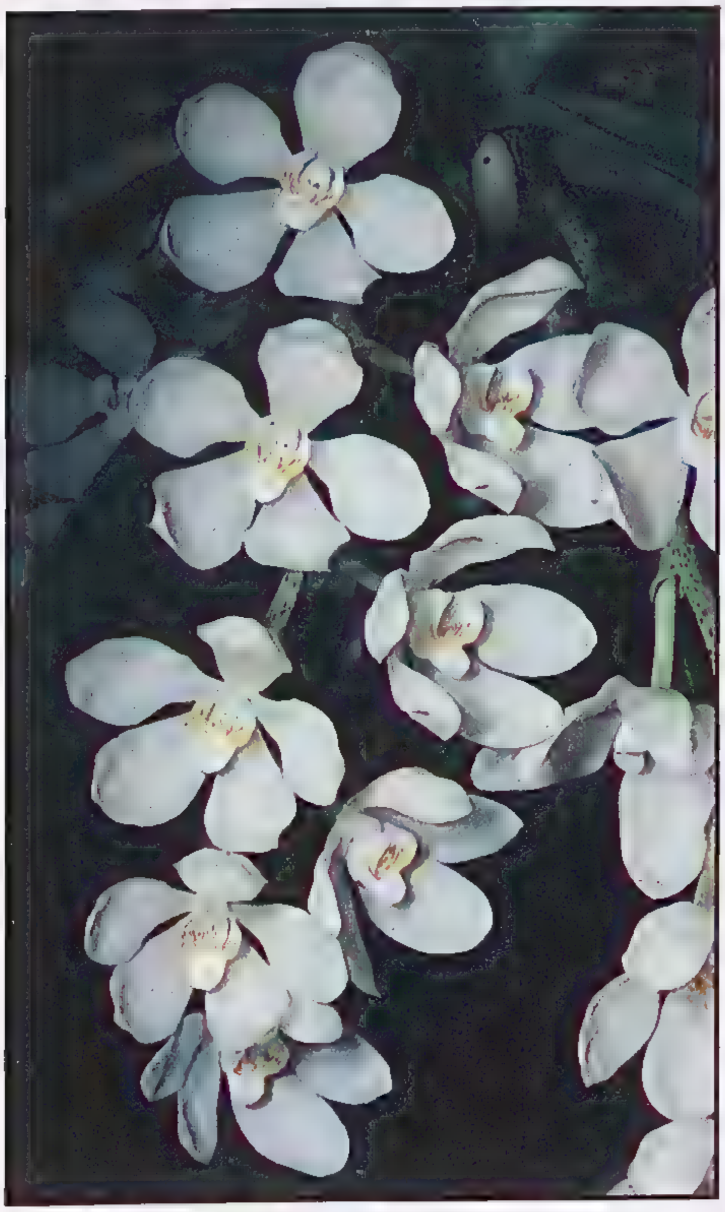


Plate 64: *Sarcochilus falcatus*. Photo: D. Titmuss.

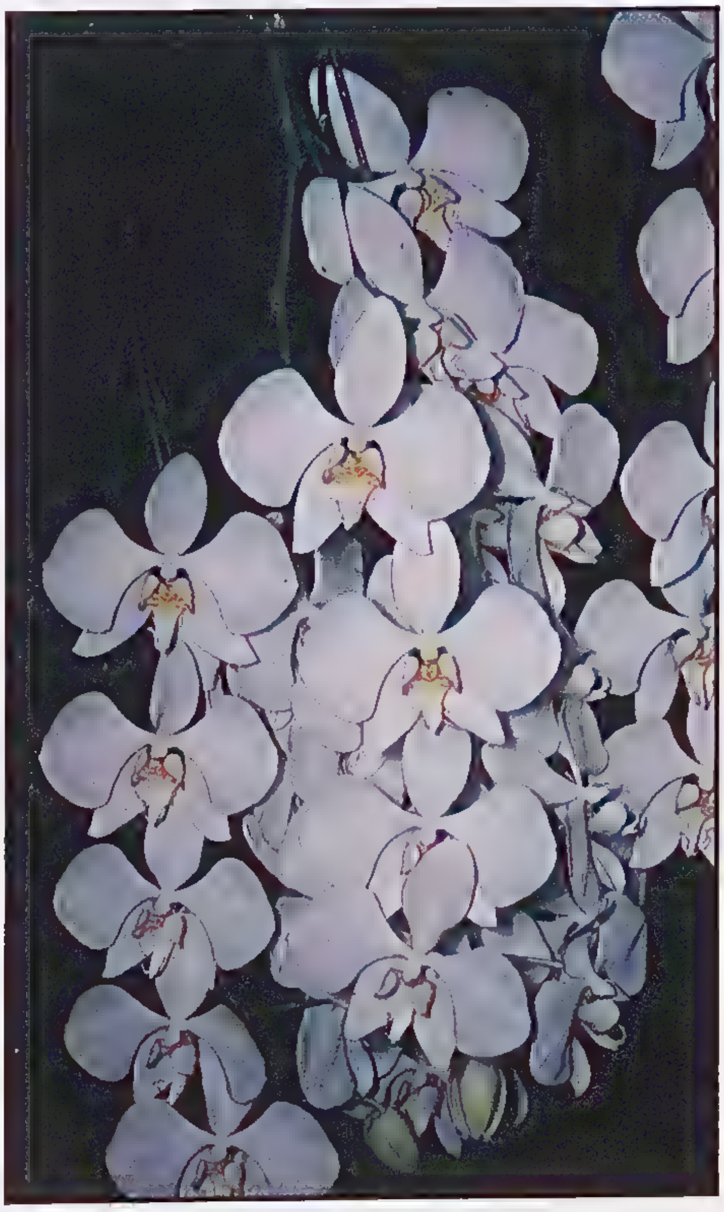


Plate 65: *Phalaenopsis amabilis* var. *rosenstromii* 'Sharon' ACC/ANOS. Photo: D. Titmuss.

AUSTRALASIAN ORCHIDS ILLUSTRATED

No. 20: *Thelymitra epipactoides* F. Muell.

Common Name:	Metallic Sun-orchid
Subfamily:	Orchidoideae
Tribe:	Diurideae
Subtribe:	Diuridinae
Genus:	*Thelymitra* J. R. Forst and G. Forst

Distribution: The genus *Thelymitra* is found mainly in Australia with several species occurring in New Zealand and one species in New Guinea, New Caledonia and the Philippines. *Thelymitra epipactoides* is found in Victoria and South Australia.

Notes: All species of *Thelymitra* are terrestrial orchids and are amongst Australia's most colourful orchids, with the majority producing flowers which are shades of blue, red, pink or yellow. There are currently between 33 and 60 species of *Thelymitra*, depending on the interpretation of species limits. The plants usually produce a single, hairless, lanceolate leaf which is erect and sheaths the base of the flowering stem. *Thelymitra* species are found as single plants or in small colonies. The flowers of *Thelymitra* are unusual as the labellum is usually the same shape and colour as the other petals, although the column is broadly winged and adorned with lobes, hair tufts (trichomes) and callii. The common name for the genus of sun orchids, originates as the flowers only open on warm days. *Thelymitra epipactoides* has an erect flowering stem which can reach a height of 60cm and produce between 5–20 flowers which are up to 40mm in diameter. The colour of the perianth varies between plants from greenish-yellow to greenish-blue and is sometimes reddish, bronze or grey and always has a metallic lustre. The column wings have side-lobes which protrude forward and end in dense tufts of white hairs. The mid-lobe has an erect semicircular ridge which is yellow or pink and there are also two accessory-lobes which reach forward and almost meet. The ridges of these lobes are also yellow or pink.

Pollination: This species has been reported by Cropper and Calder (1990) to be pollinated by a species of native bee from the genus *Nomia*. These researchers suggested that this orchid was a general mimic of other food providing flowers in its area and that by producing a range of floral colours the pollinators would take more visits to realise that no reward is offered by these flowers.

Conservation Status: This species has been recognised for a long time to be endangered. It is generally restricted to heathland communities and is found either as single plants or small colonies. The development of conservation management practices and close monitoring of this orchid, has resulted in the stabilisation of numbers and more seedlings over recent seasons in Victoria. Further work is still required to maintain this species.

Culture: Although difficult, this orchid can be successfully cultivated and maintained under 25% shade in a basic terrestrial orchid mix.

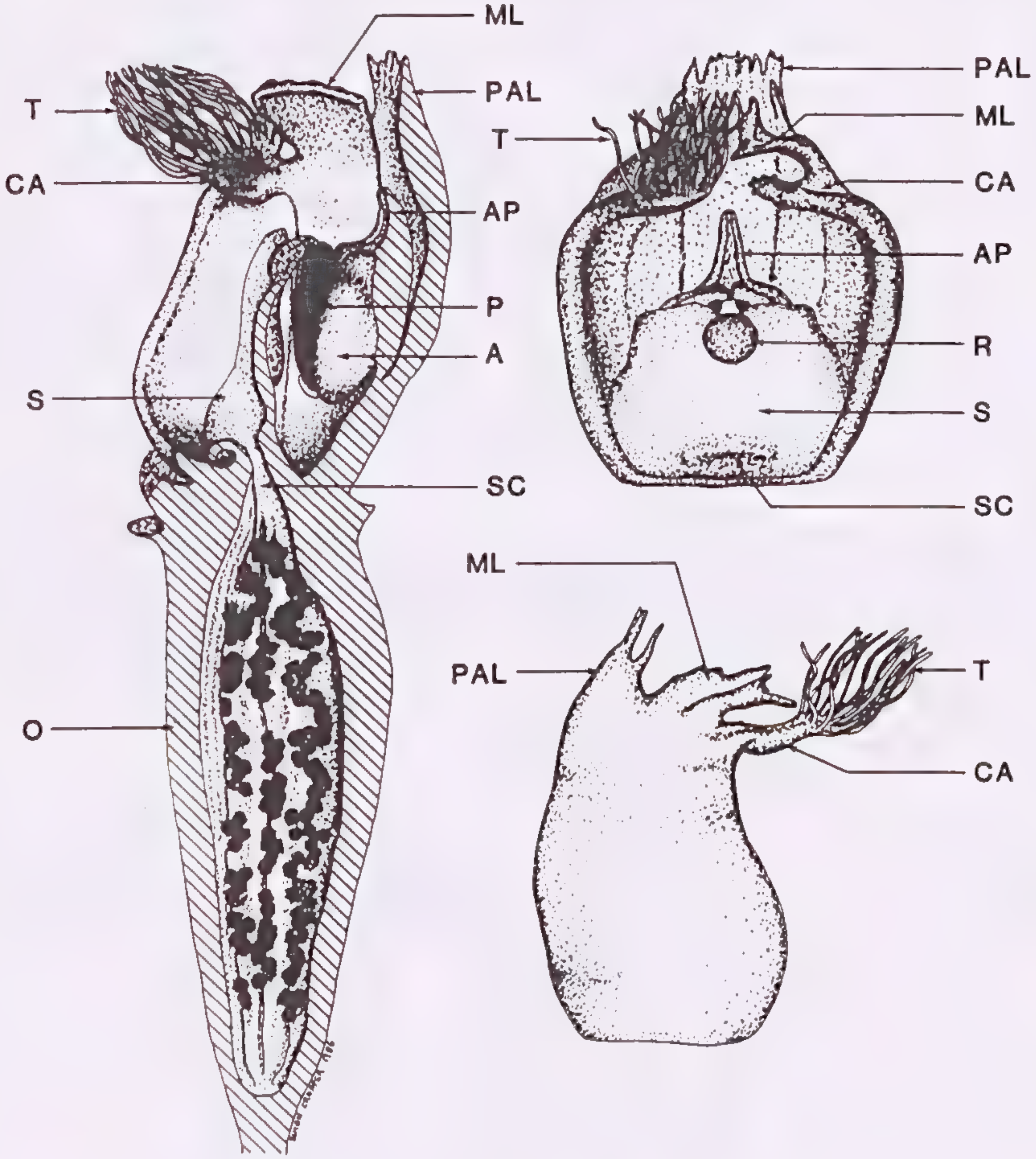
Illustration: Painting: The *Thelymitra epipactoides* illustrated is a steely blue-grey colour. There are two flowering stems which were grown well in cultivation and have produced around 10 flowers on each stem. Line Drawings: Illustrated are three views of the column — the flower cut in half with the perianth removed, the column from the front and a side view of the column showing the column wings.

Description: Tony Slater, 17 Dudley Street, Mitcham, Victoria 3132.

Illustration: Helene Wild, 56 Civic Parade, Seaholme, Victoria 3018.

Line Drawings and Captions: Simon Cropper, Botanicus, 16 Bell Street, West Sunshine, Victoria 3020.

(The floral material was kindly donated by Helen Richards. Line drawings reproduced with the permission of the Royal Society of Victoria).



Thelymitra epipactoides F. Muell.

Three views of the column drawn by Simon Cropper.

A — Anther
AP — Anther point
CA — Column arm
ML — Mid-lobe
O — Ovary
P — Pollinium

PAL — Post anther lobe
R — Rostellum
S — Stigma
SC — Stylar canal
T — Trichomes

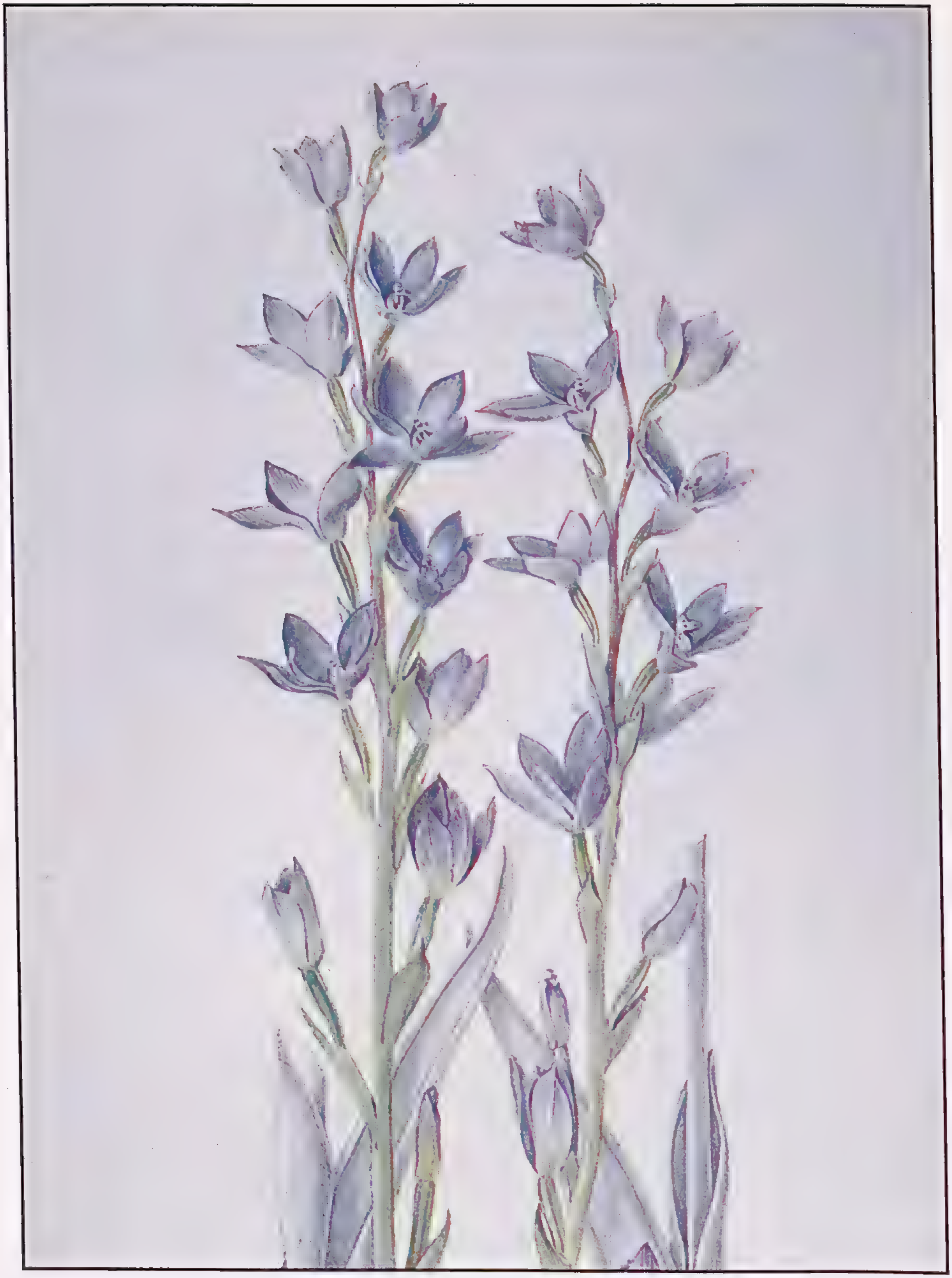


Plate 66: *Thelymitra epipactoides* F. Muell.
From a painting by Helene Wild.

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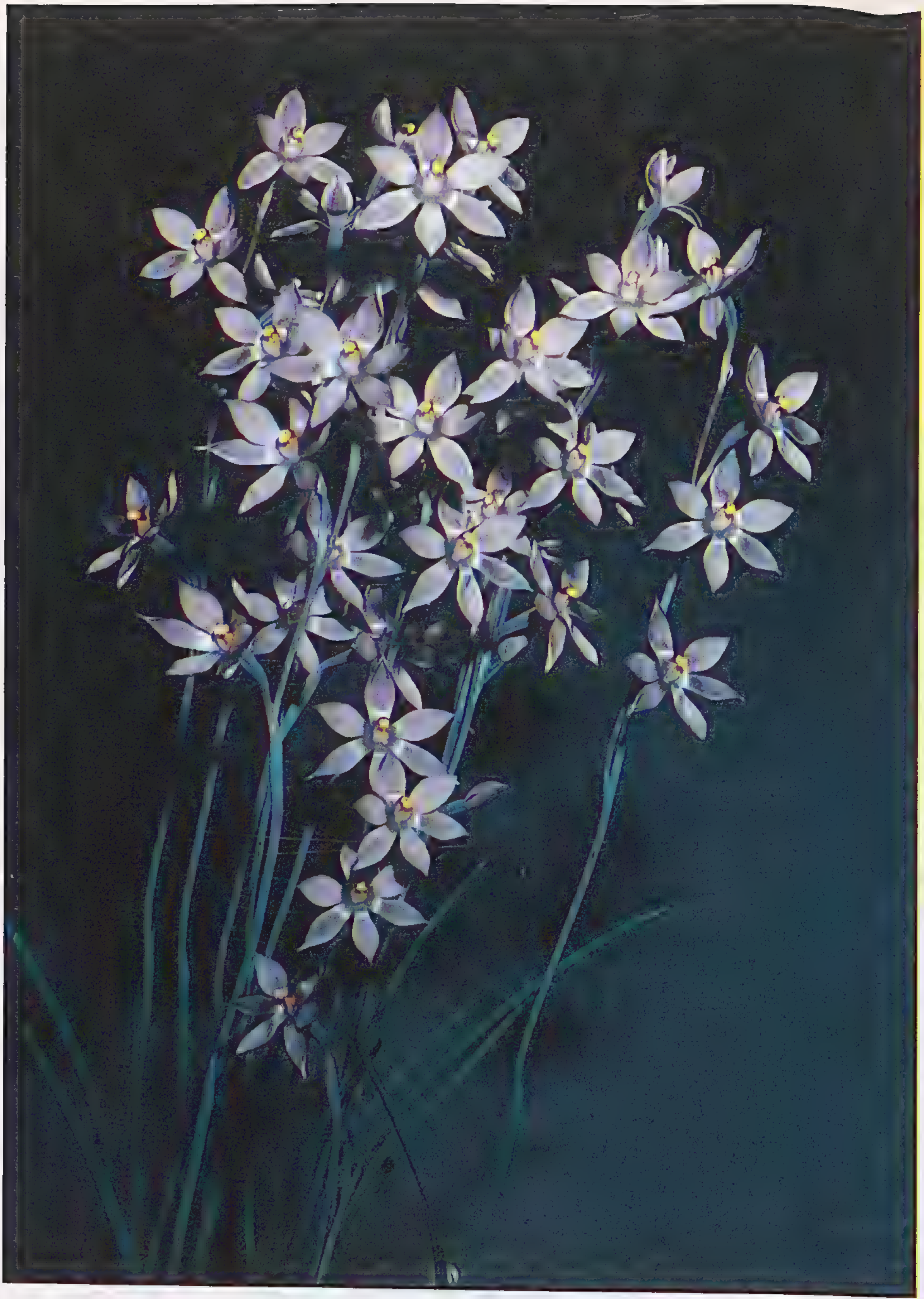

Plate 67: *Thelymitra Xchasmogama. Photo: L. Peggie.*

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The Orchadian

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TALKING POINT

Sadly, in many respects, this is my last *The Orchadian* as editor, but four years and 16 issues is enough, we need a change and I am sure, our editor-elect will give it to us. When you receive this issue my wife Jill and I will be in the U.S.A. where I will be commencing a lecture tour of the U.S.A. and Canada, during which I will be talking to 13 different orchid societies about our unique native orchids. I know from past tours our orchids are very popular over there and many are grown by American orchidists. There is always an Australian native orchid in their annual list of awarded plants.

Over the past four years, I like to think *The Orchadian* has gone from strength to strength. Every issue has been on time, never less than 48 pages and since March, 1995 four out of the last six issues have contained 64 pages. The number of colour plates has also increased. This, of course, can only be continued if you, the members, keep writing the articles. We are totally dependent on you, without our authors we do not have a journal. As I have said many times, everyone of our members has a story to tell, about your favourite native, about a happening at your society or how you grow that special plant so well. Do not be shy, write it down and send it to our new editor, make his job easier, after all he isn't paid to do the job and it takes up a lot of his time, he is doing it for you. The new team can only improve and take our journal forward to greater heights if we all pull together, it is the medium by which we tell our members and the world about the gems we have in our great country. We are the guardians of our native orchids, let us show the world that we are proud of them and want everyone to know more about them.

There is one thing I would like to ask of our contributors, please let the editor have your articles, at least by the deadline date that appears on the inside front cover of this journal and if possible earlier, this gives the editor more time to put the journal together and so ensure it is on time. We also need to increase our subscribers, to help pay for the costs of improvements and the number of colour photographs in our journal, I know I have reduced the cost per issue over my period as editor, mainly because I have used my own labour instead of from outside, this may not always be possible. We now have a few more advertisers, please support them, after all they do help to pay for your journal with their support.

Just a thought, why don't you give a friend a subscription to our journal as a birthday present or a Christmas present.

I would like to draw your attention to the article on the Third Australasian Native Orchid Conference and Show to be held at Flinders University in Adelaide (page 596). If you have not already registered, may I suggest you give it much consideration, it is going to be the best native conference so far, a lot of planning is being carried out by N.O.O.S.A. Everybody, who is anybody in native orchids will be there, so it will give you a chance to meet them and friends whom you may not have seen for a long time. Not only will it be a learning experience, but a pleasureable and social one. See you there!

Do not forget to send your articles for the next issue to David Banks, 39 Carole Street, Seven Hills, N.S.W. 2147 Australia.

I will take this opportunity to thank the many contributors and the active Editorial Associates for their support and assistance during my term of office.

Walter T. Upton

THE ORCHADIAN

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Dendrobium schneiderae var. *major* 'Margaret' HCC-ACC/ANOS — Rear Cover

DENDROBIUM SORIENSE — A NEW SPECIES OF SECTION *SPATHULATA* FROM SORI ISLAND, MANUS PROVINCE, PAPUA NEW GUINEA

N. H. S. Howcroft
Forest Research Institute
P.O. Box 314, Lae, P.N.G.

A new species of *Dendrobium* is named and described in this paper. The species superficially resembles *Dendrobium conanthum* Schltr. in its gracile habit, to some degree its flowers also bear some resemblance to some of the floral forms of this species. The flower characters are such that it should make a useful contribution to breeding programmes in this section.

Dendrobium soriense **Howcroft species nova *Dendrobio conantho* Schlechter arcte affinis, sed callo quinque-carinato et lobo medio labelli oblongo-ovato, tricarinato.**

Dendrobium soriense **Howcroft sp. nov. close to *Dendrobium conanthum* Schlechter but callus five ridged and median lobe of labellum oblong-ovate with three keels. Typus: Papua New Guinea, *Tkatchenko et al.* 79016 (holotypus LAE).**

Plant a medium-sized epiphytic herb similar to *D. conanthum*. **Rhizomes** short, cylindrical. **Pseudobulbs** slender, canelike, clustered, terete, many noded, slightly dilated towards the base, 100cm or more tall, c. 1.5cm diameter towards base. **Leaves** oblong-ovate, minutely unequally bilobed, leathery, c. 4–9cm or more long, c. 2–5cm or more wide; **sheaths** tubular. **Inflorescences** borne towards the apical part of the stem, racemose, spreading to arcuate, about 25cm or more long, bearing c. 9–20 flowers; **peduncle** slender, terete. **Flowers** mostly erect, pale yellow brown with a pink flush with ▪ violet veined lip; **dorsal sepal** upright to reflexed, spirally twisted, narrowly oblong-lanceolate, margins undulate, c. 2.3 x 0.7cm; **lateral sepals** reflexed or not, spirally twisted, oblong-lanceolate, acute, 3.2cm long along basal magin, 2.2cm long along top margin, 0.9cm wide at base, c. 0.6cm wide at midsection, margins undulate; **mentum** conical, prominent; **petals** linear-spathulate, acute or obtuse, 2.7cm long, 0.7cm wide towards apex, spirally twisted once to twice; **labellum** 3- lobed, elliptic in outline, c. 2.8cm long, 1.5cm wide flattened, **lateral lobes** narrowly oblong-elliptic, rounded in front, overlapping base of mid-lobe, 2.0cm long, 0.5cm wide, with verruculose venation and erose margins towards apices; **mid-lobe** slightly recurved, oblong-ovate, sub-acute, 0.9–1.0cm long, 0.8cm wide, margins not erose; **callus** of five keels, the three middle ones prominently raised and terminating on mid portion of the mid-lobe; **column** 0.6–0.7cm long, 0.4cm wide, 3–4 teeth on short broad stelid on each side of the clinandrium; **column foot** c. 1.3–1.4cm long, at c. 120 degrees angle from axis of column. **Ovary** c. 0.6cm long; **pedicel** approximately at 90 degrees to ovary, 3.5–3.7cm long. **Anther** cap apically notched.

Distribution: First discovered on Sori Island in the Manus Province and more recently along the north coast line of Lorengau to Sori Island. The species is found growing in mangroves overhanging the water. The new species is reported to be found only along rivers and island areas.

Notes

1. The specimens used to describe this species are a part of a fairly large live collection made by Mr Justin Tkatchenko, manager of National Capital Botanical Gardens and his assistants. Because this new species looked so similar to *D. conanthum* Schltr. in plant habit and to some degree in the flower, it was thought that these plants may have been part of a hybrid swarm. However, it is understood from Mr Tkatchenko's verbal account of the orchid flora on this island that *D. conanthum* did not grow there and that the only other species in the area was *D. mirbelianum* Gaud.
2. For comparison a second illustration of a second specimen of the new species is included here (Fig. 2) along with illustrations of *D. conanthum* from Labu swamps, Lae (Fig. 3) and New Ireland (Fig. 4). Attention is drawn to the differences between the labellum characteristics of the two species wherein the lateral lobes of *D. conanthum* are broader and more rounded, the base of the mid-lobe and the mid-lobe itself is much narrower and finally, the presence of five keels on the callus terminating into three keels on the mid-lobe of the new species compared to the three keels terminating as one keel on the mid-lobe of *D. conanthum*.

   In other characters, such as those of the petals and sepals, there are fairly close similarities; likewise the features of the columns are similar between the two species though it may be worthwhile studying these characters further when looking at the *D. conanthum* complex in more detail.
3. The new species is named after Sori Island where it was first discovered.

Acknowledgements

I wish to thank Justin Tkatchenko for the opportunity to study material from his live collections of the new species and for additional details on the local distribution of the species. To Bill Baker, of Kew Herbarium, a special thanks for checking the description of the new species and for his useful comments.

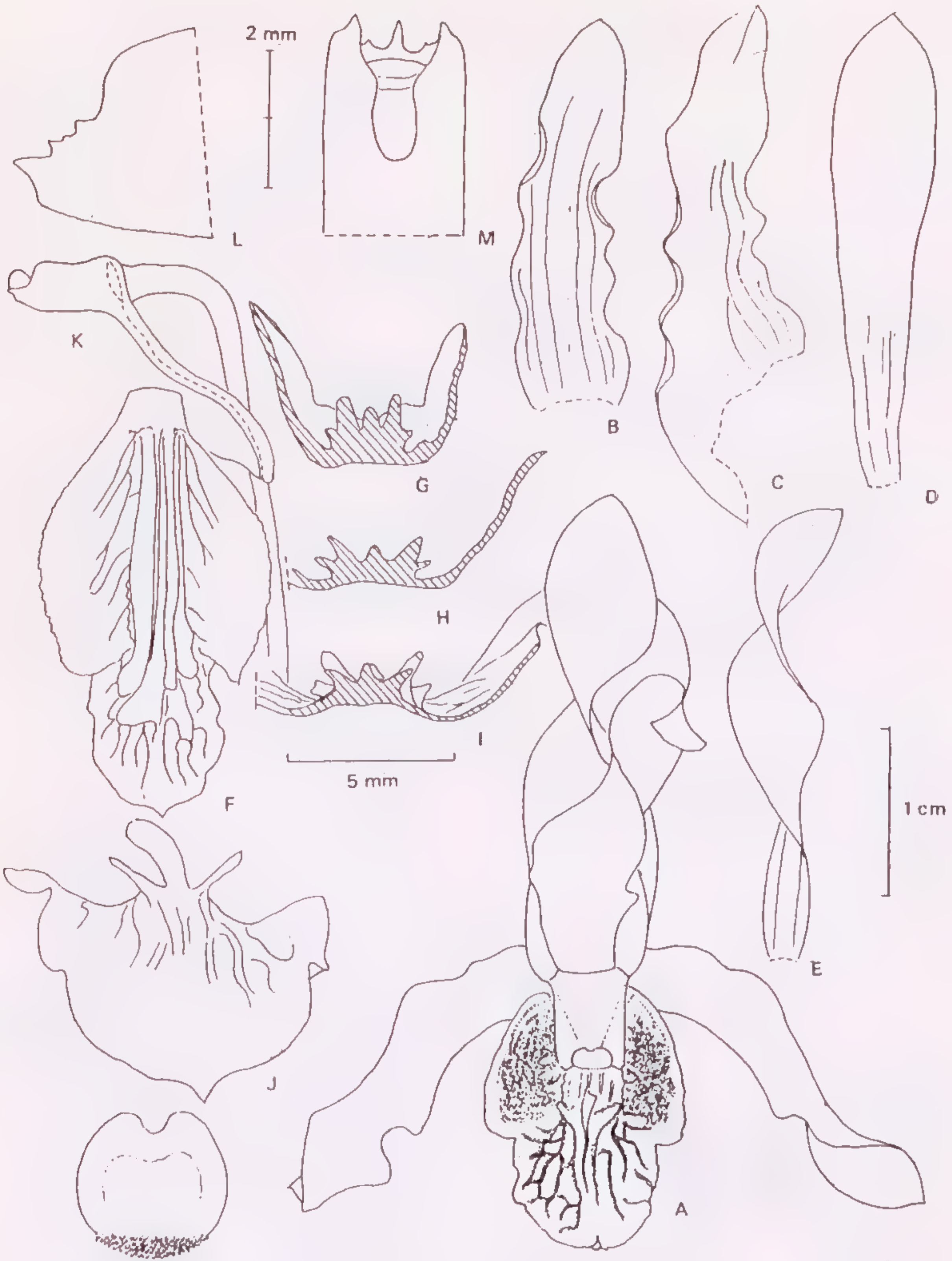

Fig. 1: *Dendrobium soriense* sp. nov. Howcroft.
Holotype Tkatchenko 79016

(A) flower 1cm scale; (B–F) dorsal sepal, lateral sepal, petal flattened, petal normal, labellum flattened, 1cm scale; (G–I) cross sections of callus taken from section of labellum as indicated, 5mm scale; (J) mid-lobe of labellum with keels; (K) column, column foot, pedicel and ovary, 1cm scale; (L–M) apex of column, lateral and ventral views, 2mm scale; (Unmarked) anther cap.

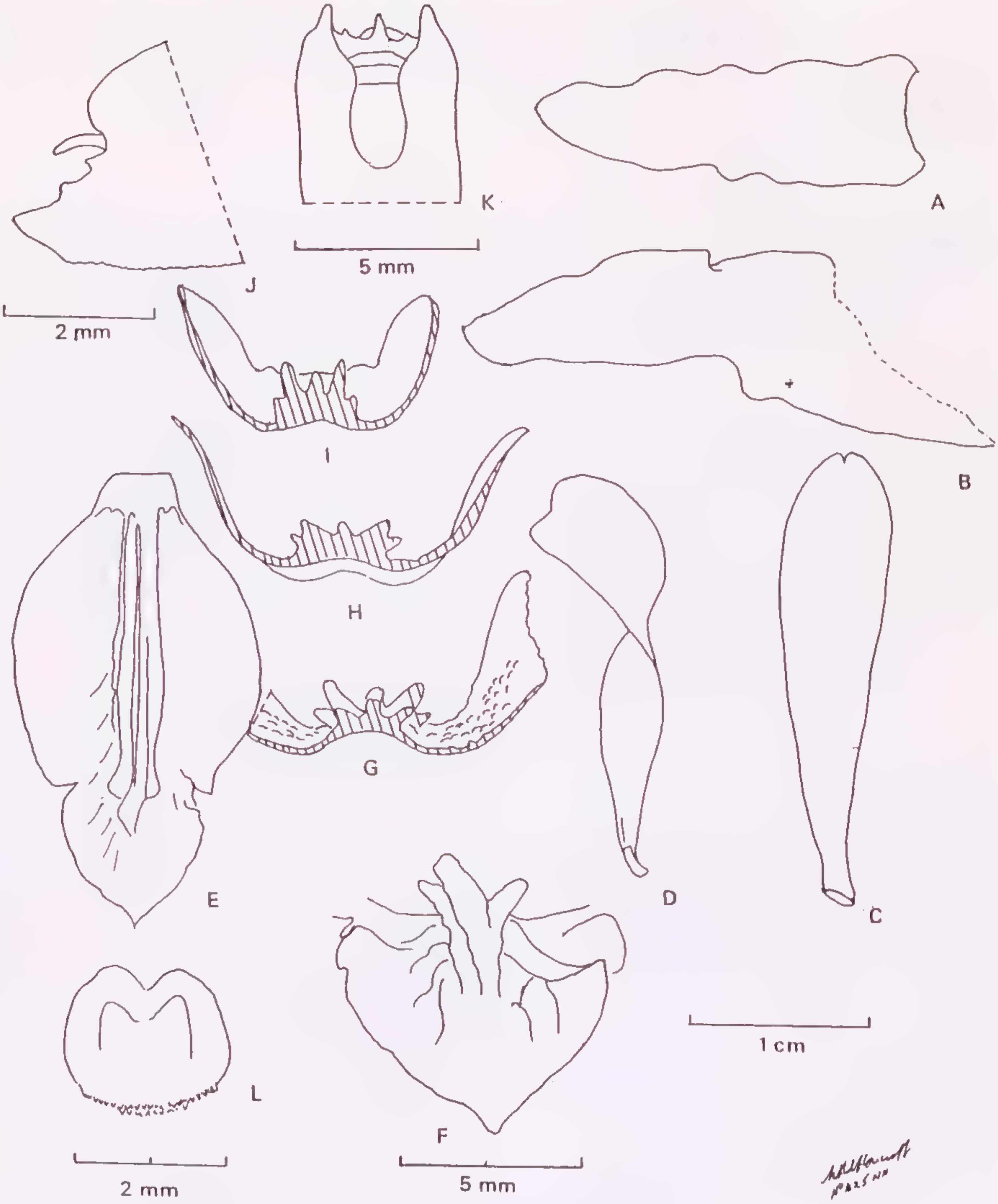

Fig. 2: *Dendrobium soriense* sp. nov. Howcroft.
Specimen No. 2

(A–E) dorsal sepal, lateral sepal, petal flattened, petal normal, labellum flattened; (F) mid-lobe of labellum with keels; (G–I) cross sections of callus taken from sections of labellum as indicated, 5mm scale; (J–K) column apex, lateral and ventral views, to 2–5mm scales; (L) anther cap.

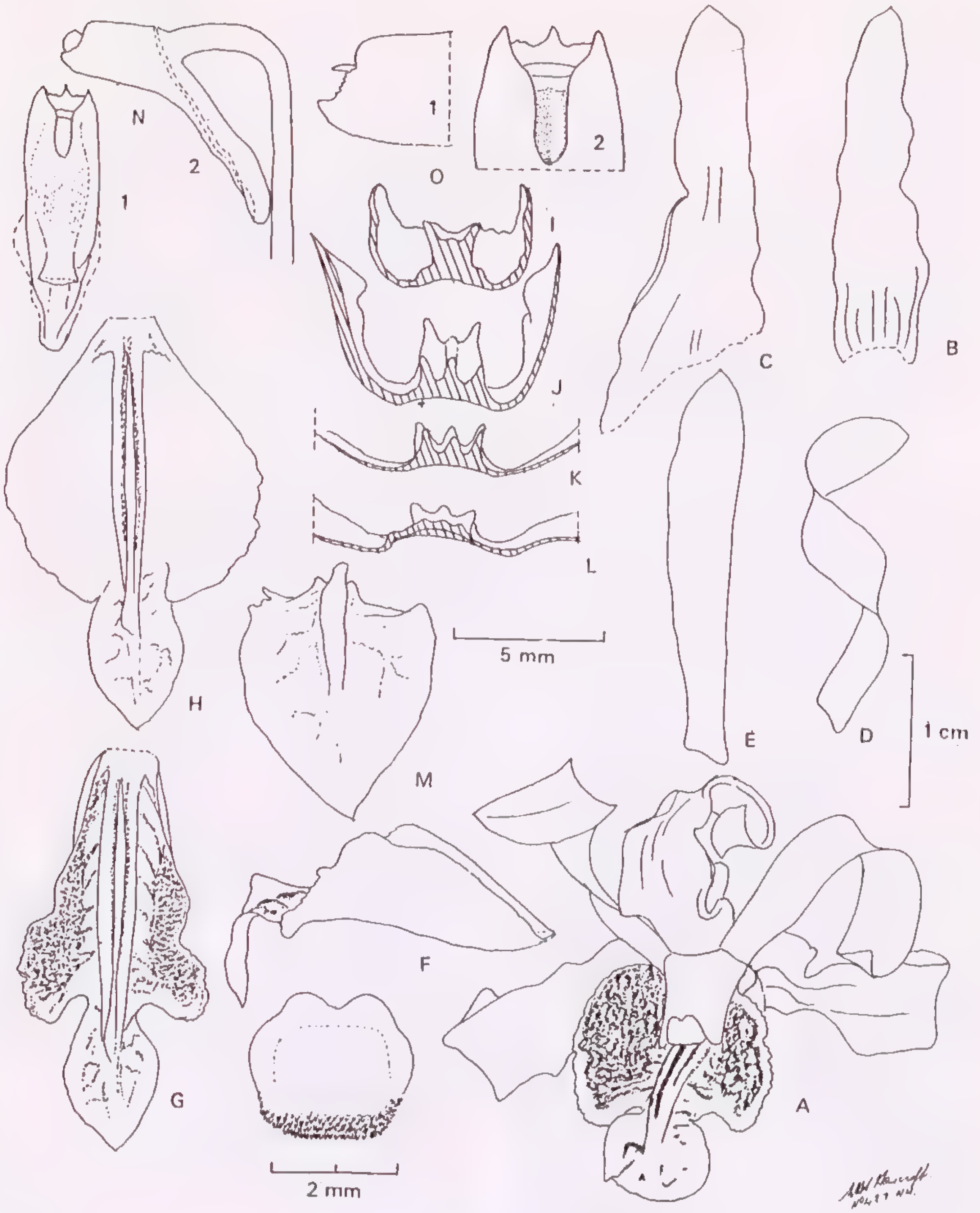

Fig. 3: *Dendrobium conanthum* Schltr. ex Labu, Lae

(A–H) flower, dorsal sepal, lateral sepal, petal normal, petal flattened, labellum normal from above and side, labellum flattened; (I–L) cross sections of callus taken from section of labellum as indicated; (M) mid-lobe of labellum showing keel; (N 1–2) column and foot, ventral and lateral views; (O 1–2) apex of column, lateral and ventral views.

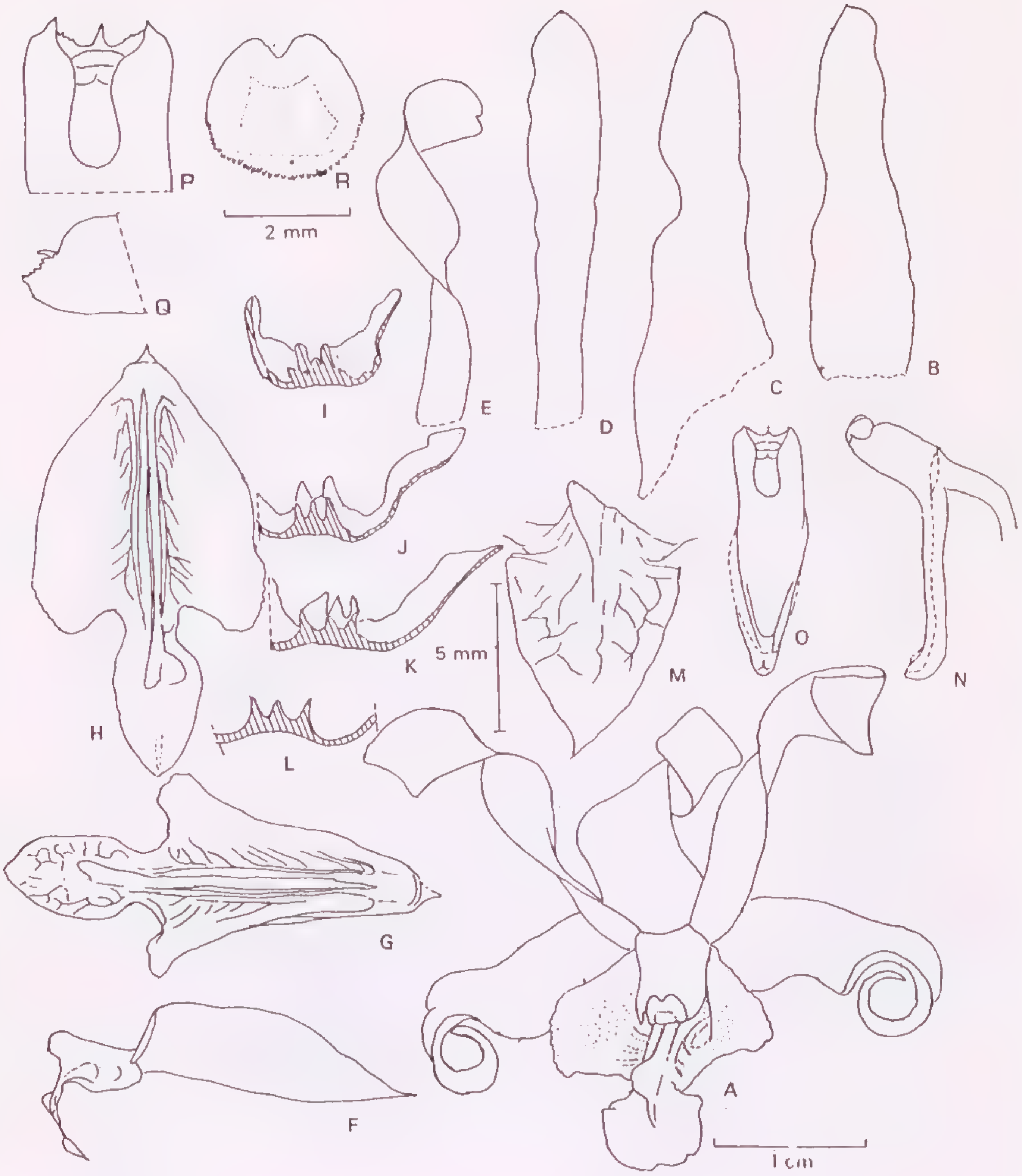

Fig. 4: *Dendrobium conanthum* Schltr. ex New Ireland

(A–H) flower, dorsal sepal, lateral sepal, petal flattened, petal normal, labellum from side, labellum from above, labellum flattened, to 1cm scale; (I–L) cross sections of callus taken from sections of labellum as indicated, to 5mm scale; (M) mid-lobe of labellum with keel; (N–O) column and foot, lateral and ventral views, to 1cm scale; (P–Q) apex of column, ventral and lateral views; (R) anther cap, to 2mm scale.

TREASURES OF THE DEEP

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For many years now I have been bushwalking and rock climbing in the Blue Mountains and other national parks and I have developed a love and appreciation for the flora of this country. However it wasn't until 1994 that orchids caught my eye and the fascination and love of these plants hasn't let up since. Now whenever I go into the bush my eyes are instinctively scanning the landscape for these wonderful plants.

Whenever I spot a new one I enthusiastically track down its identification, habitat, range and growing requirements.

On a recent excursion down a small brook in the Blue Mountains I was startled by the range and diversity of orchids growing in the forest and on the rocks adjacent to its water course. The following is an account of what was found.

In late November, 1995, a group of us headed for the Kanangra Walls National Park in the south-western corner of the Blue Mountains to do a descent of Kanangra Brook. On our journey to the "walls" we went via the Jenolan Caves. Just before we were about to pass through the caves I noticed a limestone cliff up to the left that had quite a few large healthy bunches of *Dendrobium speciosum* growing on it. These plants had me wondering if the conditions around the root zone were alkaline due to the limestone. Perhaps the build-up of organic material in this region created a sufficient buffer to a high pH or perhaps *D. speciosum* is very adaptable. Virtually all other plants I had seen were growing in neutral to acidic conditions.

Anyway before long we arrived at the "walls" and prepared for our descent of Kanangra Brook. Kanangra Brook is probably not your usual orchid lovers idea of a pleasant stroll to view the local flora, nor was it mine on the day but I was in for some pleasant surprises.

Our descent of the Brook started near the Kittani Rim at an altitude of just over 1,070m (3,500 ft) and we would only travel less than 1km down stream, however in this distance the brook plunges 520m (1,700 ft) into the ravine known as the Kanangra Deep. Most of our day would be spent hanging from ropes.

At the top of the brook I scanned the area for orchids and noticed some *D. striolatum,* some still in flower and *Liparis reflexa.* Both plants were growing on the metamorphosed siltstone which is typical to this part of the "walls".

As we began to descend our ropes adjacent to the waterfalls, numerous large bunches of healthy *Dendrobium speciosum* were growing over the walls. These walls were north facing and received sunlight throughout most of the day. These plants were to remain in abundance on the walls exposed to sun throughout our entire descent. They had me wondering what a sight they must be when in flower.

After we had descended about 180m (600 ft) the brook temporarily changes its direction of flow from north to east and becomes more of a ravine than an open waterfall. This produces more shady and moist conditions adjacent to the brook and the ravine tends to hold the mists longer than the upper more exposed sections of the brook. As a result of this change in micro climate a different range of vegetation was supported and this included orchids. In the ravine small pockets of rainforest are supported (usually about 10m x 60m on either side of the creek) in the brief level areas of the brook between waterfalls.

As we first entered this part of the ravine I noticed on the mossy horizontal trunk of a shaded tree a *Bulbophyllum elisae* in flower. This was a very exciting experience as this was the first time I had seen this plant growing in the wild. Further down the ravine a large slab of rock which was in full sun, in contrast to the erlier sighting, was covered in a large mat of this *Bulbophyllum* species. However none of these plants had flowers. Perhaps they flowered earlier due to the increased light intensity and temperature.

As we descended further into the ravine the next orchid to be noticed and found to be quite prolific was *Dendrobium pugioniforme*. Once again this was the first time I had seen this plant in the wild. The plants seemed to be growing in mostly shaded to semi shaded locations and covered the rocks in large mats often hanging from the steep sides like a curtain. Some of these plants were also growing from the trees in the ravine, usually from their base and hanging down over the rocks. None of these plants were flowering at the time.

As the ravine deepened and became even more shaded *Sarcochilus* orchids became very prolific on the small to medium sized trees growing in this part of the ravine. By now my companions were giving me strange looks as I intently studied almost every tree I passed. The conditions were so suited to the growth of these orchids that their abundance of roots completely obscured the bark on the limbs of some of the host trees. *S. falcatus* could easily be identified due to its falcate leaves however another species was not clearly identified, perhaps *S. australis,* though this was out of its altitude range.

Plectorrhiza tridentata was also seen growing in this area on both rocks and trees.

Liparis reflexa was common on the rocks throughout the ravine growing from shady ledges and crevices.

As the ravine began to open up towards its confluence with the Kanangra River larger trees such as (cedar) *Toona australis* had established themselves along the sides of the brook where the terrain permitted. These trees had become hosts to a number of *Dendrobium teretifolium.*

As we began the climb out of the gorge, via the appropriately named Murdering Gully, I glanced over to the many other ravines froming part of the Kanangra Deep, all with their own unique microclimates. I wonder what unique flora they must support.

Finally we topped out and on our walk back to the car the last orchid of the day was *Caleana major* in flower.

The rich orchid flora of this obscure area was a surprise, thankfully its a National Park. ✤

AUSTRALIAN NATIVE ORCHID HYBRID REGISTRATIONS

(New registrations from lists in *The Orchid Review,* March–April, 1996):–

Name	Parentage	Registered by
Dendrobium		
Paula's Pride	Colonial Summit X Fiestafal	G. Leafberg
Richard's Glory	Emma X Sunglow	G. Leafberg
Woodgate Gem	Minnie X *undulatum*	G. Rex
NEW ZEALAND		
Sarcomoanthus		
Little Sparkle	*Sarcochilus falcatus* X *Drymoanthus adversus*	L. Dougherty

Reprinted from *The Orchidophile*, Sydney Group Newsletter, Australasian Native Orchid Society, March, 1996.

VIRUSES

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At the October meeting last year, Mike Harrison, A.N.O.S. Sydney Group's Research Officer, presented a report on viruses and virus infection, as commissioned by the Committee. The following article is his report, now published for the information of all members.

Viruses are a group of minute infectious agents characterised by a lack of independent metabolism and the ability to replicate only within the living cells of the host organism. As such they are obligate parasites.

There has been some debate about whether viruses should be considered as truly living organisms. On one hand they are constructed of organised organic compounds and they are able to multiply with genetic continuity (hereditary characteristics are transmitted by nucleic acids) with the possiblity of mutation.

On the other hand however, once viruses are removed from their host, they are entirely inert and exhibit none of the characteristics usually attributed to the living state. Even within their host, they do not carry on respiration or synthesise any materials for energy and growth. Even multiplication, which can occur only within host cells, differs from reproduction in other organisms. The virus particles do not grow and divide and particles do not arise from pre-existing particles.

Viruses are composed of a protein sheath surrounding a core of nucleic acid, either DNA or RNA, which carries the genetic code of the virus (as in all organisms, the DNA or RNA carries the hereditary information).

Their method of replication is to invade a host cell and to convert the activities of that host cell to producing more virus particles. In effect, they switch the genetic code of the host cell, although it is not clearly understood how this mechanism works. In doing this, the host cell is destroyed and the newly formed virus particles are released to invade surrounding host cells.

Viruses are extremely small in size and are invisible even under the most powerful light microscopes. An electron microscope is used to study them.

In shape they may be oval, spherical, polyhedral (with numerous facets), rigid rods or flexible threads. They are not given scientific names as such, like truly living organisms and are usually named after their main host or the disease symptoms produced.

Viruses are generally separated into three subgroups — bacterial viruses, plant viruses and animal viruses.

ANIMAL VIRUSES

Many infectious diseases of humans and other animals are caused by viruses, from common childhood diseases like chicken pox, measles and mumps, through to the common cold, influenza, herpes, warts, viral pneumonia, Poliomyelitis, to the real nasties such as Yellow Fever, Rabies, Small Pox, AIDS (HIV virus) and Marburg's Disease (a highly fatal haemorrhagic fever caused by the Ebola Virus).

Most viruses are highly infectious and are readily transmitted from diseased to healthy hosts by various means. Many are spread by direct contact or by droplets in the air. Mosquitoes and ticks are also common transmitters.

We control virus infection by:–

- Natural species or race immunity (not affected at all to mildly affected).
- Developed immunity due to previous exposure and subsequent production of antibodies.

- Immunisation by a specific vaccine (a suspension of killed or altered micro organisms administered to produce antibodies).

Antibodies attack and neutralise viruses by isolating and/or metabolising them.

PLANT VIRUSES

Over 400 plant viruses have been identified. Among economically important plants affected by virus are potatoes, tomatoes, sugar cane, corn, wheat, peaches, beans, rice, cucumbers, strawberries, raspberries, apples and many ornamentals including of course . . . orchids.

Viral diseases are generally most serious in plants that are vegetatively propagated by man. Virus may kill localised areas, entire plants, or most commonly, reduce plant vigour and thus yield.

Methods of plant virus transmission are numerous, including direct contact, sap drip and insect vectors such as aphids, thrips, white fly, mealy bugs and grasshoppers.

In cultivation the most common form of transmission is sap transfer from an infected plant by cutting tools, which occurs commonly during grafting, pruning and cutting flowers. Mechanical and insect transmission may also occur.

The mosaic group of viruses are important; the effect they produce is a mottled or irregular patchwork appearance caused by chlorophyll destruction. Foliage may also be wrinkled. Another symptom is colour-breaking in flowers especially in gladioli, pansies and wallflowers. This response, however, is best known in tulips, which feature streaks or lines of contrasting colours. Many have been in cultivation for years and show no signs of cumulative weakening. In bygone days some strains attracted high prices.

VIRUS IN ORCHIDS

A number of viruses are known to infect orchids.

For many years growers have been aware of Tobacco Mosaic Virus, Cymbidium Mosaic Virus, Cymbidium Necrotic Ringspot Virus and Odontoglossum Ringspot Virus. In recent times a new group of viruses known as Rhabdovirus, has been identified in collections in Australia.

In a series of articles in some of the orchid journals including *The Orchadian,* over the past 18 months or so, Don Gowanlock of University of Queensland has detailed the symptoms associated with these "new" viruses. They are excellent articles, and all growers should read them and take note of the pictures.

However, for the average grower, precise identification is not really important. All we really need to do is recognise the symptoms of virus infection generally and take steps to prevent its spread.

The presence of virus in orchids disrupts normal growth and may cause weakness, distortion and malformation. The effects are especially noticeable in stressed plants. Leaf symptoms include irregular chlorotic or mosaic patterns, necrotic streaks and spots, often in circular or mosaic patterns and erosion of the leaf surface. Other symptoms include reduction and/or distortion of stems, leaves and inflorescences, colour-break in flowers and bud drop. Plants weakened by virus are also more susceptible to attack from other diseases and pests.

In the collections of most growers, it will be leaf symptoms that will indicate the presence of virus. While leaf symptoms are many and varied and may be quite different from genus to genus, the main differential diagnostic features are the more or less circular arrangement of the necrotic spots and the presence of chlorotic areas, usually in association with the necrotic spots and patterns (Chlorosis is an absence or reduced amount of chlorophyll, giving a yellow or bleached appearance).

Even plants with no apparent symptoms may be infected, with good culture masking the effects, but eventually the signs will show through.

As with other plants, sap transmission will carry virus from an infected orchid to a non-infected orchid. This commonly happens with cutting implements such as scissors, secateurs, knives and the like. Plant leaves rubbing together or even just touching, on the nursery bench, during transport or at shows may also transmit virus. Touching your plants, especially running your fingers along the leaves as many growers do to kill aphids, may also transmit virus. Pollen transfer is also known to result in virus transmission.

Virus particles are very small and can enter through the tiniest of wounds on a plant, wounds that may be quite invisible to the naked eye.

After mechanical transmission, which is essentially the result of cultural techniques and practices, the next main method of virus transmission is by sucking and chewing insects. Aphids in particular are known carriers of virus and other suspects must include thrips, mealy bugs, grasshoppers, beetles (especially the *Dendrobium* Beetle) and scale insects.

TREATMENT

You cannot do anything about a plant once it is infected with virus. There is **no treatment** and **no cure,** so you must at least isolate an infected plant from non-infected plants and preferably **destroy it by burning it.**

Do not put it in the bin or take it to the tip, as someone will pick it up and take it home with them, thereby perpetuating the problem. Remember also that all parts of the plant will be infected and divisions and aerials will carry and perpetuate the virus. Even meristem propagations (i.e. mericlones) will usually be infected.

Plants can be tested for virus if they are valuable, but even if you only suspect the presence of virus, you must isolate those plants until they can be checked. There are commercial laboratories where this testing can be done at reasonable rates.

It sounds hard to say it, but you really **MUST DESTROY** infected plants. While they remain in your collection they are a potential source of further infection and you run a real danger of contaminating non-infected plants, not only your own but other people's as well if you take your plants to meetings and shows.

CONTROL

Do not use any cutting instruments from plant to plant without sterilising such instruments in between — by flame or boiling, by alcohol or by soaking in a saturated solution of Trisodium Phosphate. This means any cutting of plants, including rhizomes, stems, leaves, inflorescences and flowers.

Do not unnecessarily touch or handle your plants and especially keep your hands off other people's plants at meetings and shows.

When working in your plants (repotting, potting-on, grooming, etc.) keep your work surfaces clean and use fresh sheets of newspaper between each plant. When you have finished with a particular plant, wrap up all plant debris, old potting material, pots, stakes and the like in the newspaper sheets you have been working on and dispose of the package. Then wash and dry your hands, lay out fresh sheets of newspaper and start on the next plant.

This may seem like an elaborate and time consuming procedure, but it is simply a habit you must get into and it will certainly be worth it in the long run.

Do not re-use pots and potting mixes, stakes, ties or anything else that has been in contact with your plants. The big advantage of using plastic pots is that they are cheap, so you don't have to re-use them.

Do not introduce new plants directly into your collection. Keep them segregated and under observation, especially adult plants and divisions, until you are satisfied that they are clean. Likewise, do not give away, swap or sell any plant, division or aerial growth that is infected or shows any suspicious signs.

Do not allow a build-up of insect pests within your orchid house(s). An effective insect eradication programme is an important part of creating and maintaining a virus-free collection. As soon as you see something that needs attention, treat it immediately. General orchid house hygiene will assist greatly in this area.

CONCLUSION

To maintain a virus-free collection, you must adhere to guidelines detailed above. Even if your plants appear to be free of virus-like symptoms and you believe them to be uninfected, still follow the procedures. In this way you will completely rule out the possibility of transmitting virus through your collection. In the past couple of years there has been a considerable amount of research work done on viruses in orchids and growers should be aware of the signs and symptoms. Contrary to popular belief, native orchids are not somehow less susceptible to virus infection and native orchid growers cannot afford to be complacent.

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UPDATE

A couple of weeks ago I rang Don Gowanlock and spoke to him about sterilisation methods for the cutting implements we use on our orchids. These methods include flaming, boiling, alcohol, trisodium phosphate and sodium hypochlorite (bleach).

Based on his investigations and experience, Don made a number of important points:–

- Prior to any form of sterilisation, your cutting blades should be washed or wiped completely clean of any plant debris and sap. Only after this step has been taken, will the sterilisation techniques outlined below be effective.
- Sterilisation by trisodium phosphate is the preferred method. This involves making up a saturated solution of this compound (dissolving it in warm water to the point where no more will be taken into solution and undissolved crystals of TSP remain visible in the bottom of the container) and then soaking your cutting implements for 10 minutes. After you remove them, they should be rinsed in clean water to remove any residual trisodium phosphate solution.
- Flaming is effective only if it is hot enough and for long enough. A gas burner is the best thing to use (cigarette lighters are completely ineffective) and the cutting blades should be brought to the point where they begin to glow.
- Sterilisation by 70% alcohol is effective (indeed, 70% is more effective than 100%) as long as enough time is allowed. The alcohol should be in contact with the cutting blades for 10 minutes.
- Sodium hypochlorite (bleach) is probably effective, but longer soaking time should be allowed. As with trisodium phosphate, your implements should be rinsed with clean water after soaking.

Don also told me that one of the honour students at University of Queensland is currently doing his thesis on sterilisation techniques. The results of this work should be available within the next 12 months. ✤

The Australasian Native Orchid
Society is the guardian for our
native orchids.

IRA BUTLER AND BILL MURDOCH TROPHIES — SOME IMPORTANT CHANGES IN 1996

Ruth Rudkin, Hon. Sec. I.B.T.C.

At the February meeting of the Ira Butler Trophy Committee it was decided to introduce a number of changes. These changes came in response to the increasing interest in Australian native orchids both hybrids and species, in many orchid societies. These changes apply to ALL societies affiliated with the A.O.C. and/or A.C.N.O.S., A.N.O.S. Groups, State Orchid Societies or O.S.C.O.V.

These changes are as follows:–

1. Nomination for the Ira Butler Trophy may come from the winner of a section or class for Australian native orchid hybrids of all shows. Similarly the nomination for the Bill Murdoch Trophy may come from the species which is the winner of the class or section for Australian native species of a show, or if there is no separate section, the Australian native orchid of the show. For both trophies, nominations may come for plants which have been awarded an F.C.C., A.M. or H.C.C. by the A.O.C., State Orchid Societies, O.S.C.O.V., A.C.N.O.S. or any State A.N.O.S. Council.
2. There is one Gold Ira Butler Trophy for the Australian native orchid hybrid of the year and 10 Silver Trophies. Owners of all other plants nominated, including awarded plants will receive a certificate indicating that their plants had been nominated. There is only one Bill Murdoch Trophy. All other plants nominated, including awarded plants, will receive a certificate.
3. **Nomination Fee.** It was decided that each nomination for an Ira Butler Trophy should be accompanied by a fee of $10. No fee is necessary with the nomination for the Bill Murdoch Trophy.
4. **Slide photographs.** Three slides should accompany each nomination form, one showing the whole plant, one of the front view of one flower and one of an **inflorescence** to show a side view of some flowers. For awarded plants, owners should supply three slides for the Ira Butler Committee. Slides for the awarding body are the property of that body.

Further information is to be provided to all State societies, O.S.C.O.V., A.N.O.S. and native orchid society groups, together with nomination forms for both trophies.

All owners of winning Australian native orchids at their society's shows, should see the show marshall to arrange for nomination and slide photos for the trophies.

Welcome to all growers of Australian native orchids! ✾

DENDROBIUM SCHNEIDERAE var. *MAJOR* 'MARGARET' HCC-ACC/ANOS

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On a trip to Mackay, Queensland in July, 1992 I was able to purchase two plants of *D. schneiderae* var. *major* from a local who was clearing country near Eungella.

The two pieces were mounted on a gutter guard sock filled with a bark medium, treated as per Neil Finch's recipe. This mount is hung approximately 30–40cm from the 50% Sarlon covered roof of my bushhouse which faces north. On an average the plants are watered once a week in winter and three or four times a week in summer. For the past 15 months they have been watered with tank water. Until September, 1995 they had been fertilised with Horticultural Solutions H.S.O. 22 (NPK 22–8–12) during summer and H.S.O. 12 (NPK 12–12–20) during winter at the rate shown on the packet (5g to 5 litres), since September, 1995, they received a new fertiliser from Horticultural Solutions with the NPK 8–5–25.

They are fed every watering with half a teaspoon fo fertiliser to 10 litres of water.

The awarded clone *D. schneiderae* var. *major* 'Margaret' HCC–ACC/ANOS (Plate 21) carried 23 racemes up to 28cm long and averaged 28 blooms per raceme, the clonal name 'Margaret' is after a beautiful lady to whom I am married. ✾

SOME ORCHIDS AT KARIONG ON THE CENTRAL COAST OF N.S.W.

Walter T. Upton

The comparatively new township of Kariong is surrounded by Brisbane Water National Park; elevation approximately 180m and is situated about 10km to the west-south-west of Gosford on the New South Wales Central Coast. The atmosphere is a bit on the dry side, but is a most pleasurable place in which to live.

The National Park abounds with native orchids and during our morning walks, mostly before breakfast, my wife and I have so far found 12 different species; it is seldom that we walk without seeing a native orchid. All of these orchids have been seen within one kilometre of our home and all within a few metres of the path or firetrail. I am sure if we went further afield additional species would be discovered.

The spring is, of course, the most exciting time and naturally the most prolific. *Glossodia minor* flowers early in the spring and appears over a wide area,although only a short stem, it is easily noticeable because of its strong purple petals and sepals. It is pollinated by small native bees. Also seen fairly early in the spring is *Calcohilus campestris,* it had not been overly common until the spring following our bad bushfires in January, 1994, then, the following spring it came up in hundreds all along the side of the bush path as well as throughout the surrounding fairly open forest in a well drained soil. Many of the flowering stems were over 40cm high.

A very distinctive flower, made more so by the smooth metallic dark blue plates at the base of the labellum which is covered by bristly, moderately long mainly purple hairs, also the two glands on either side, at the base of the column, look like two prominent eyes. The flower attracts male scollid wasps which attempt copulation and in the process the pollinia becomes attached to them and so pollination takes place.

Another member of this genus to be found at Kariong is *C. robertsonii,* it flowered in early October, but only a few isolated plants were seen. This, in my opinion, is the most beautiful of the "beardies". The form here is, or rather was, quite superior; but a large fire department building has now been built over its habitat, another part of our parkland bites the dust. The labellum is 35mm long and is covered with long hairs that are a strikingly dark red/purple, the flowers are widely opening and the broad sepals are a contrasting light green, the column appears as a miniature human sitting in an armchair with a large hairy rug (labellum) over its legs (Plate 7).

We found *Thelymitra ixiodes* (Plate 6) growing in the fairly open bush together with the *Calochilus robertsonii* in mid-September. What a great delight it is to see our blue sun orchids, this is a colour rarely seen in orchids. The colour of these at Kariong are a strong blue/purple, with a few darks spots on the upper half of the petals. The labellum closely resembles the other perianth segments and is not adorned with callii or anything else. The flowering stems were about 45cm high and carried on average nine flowers.

Diuris aurea was only seen on few occasions at the end of September. One growing in a depression in a large open rock area with only a few stumpy bushes, a very short stem and few flowers. Normally it was growing in open forest, an isolated plant here and there. The "Golden Donkey Orchid" is easily seen because of its vibrant golden/yellow colour, which on closer examination has dark brown markings. These orchids are mostly pollinated by small native bees.

Only one small colony of *Caleana major* has so far been seen, about 10 plants at the base of a burnt tree in practically full sun. I took two

NATIVE ORCHIDS AT KARIONG

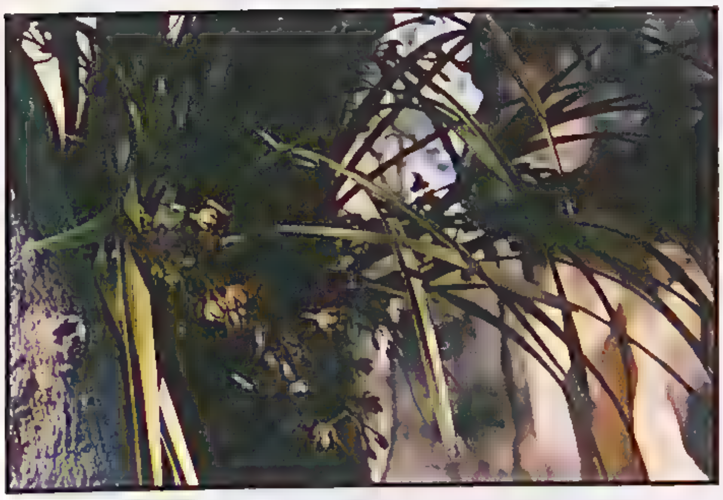


Plate 1: *Cymbidium suave.*

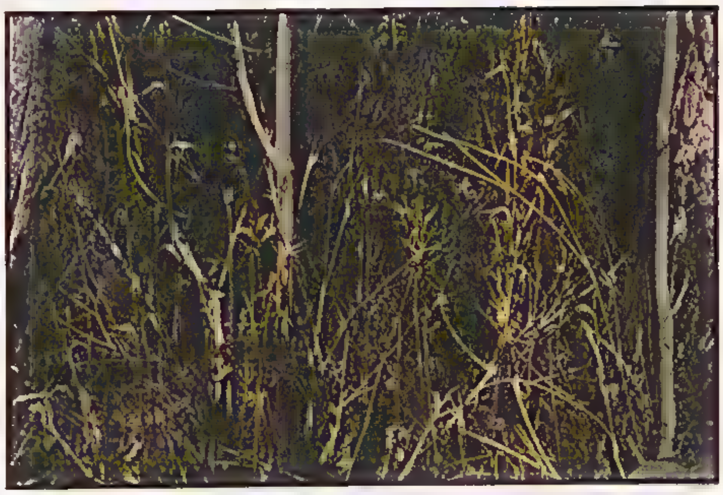


Plate 2: *Cryptostylis subulata.*

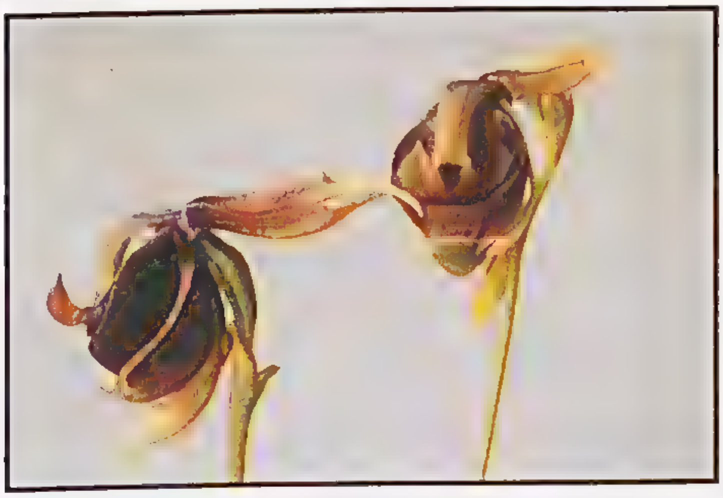


Plate 3: *Caleana major* with labellum in closed position.

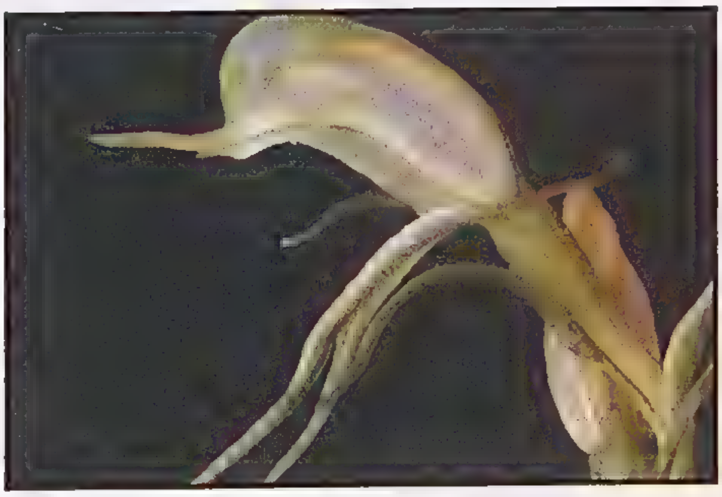


Plate 4: *Pterostylis daintreana.*

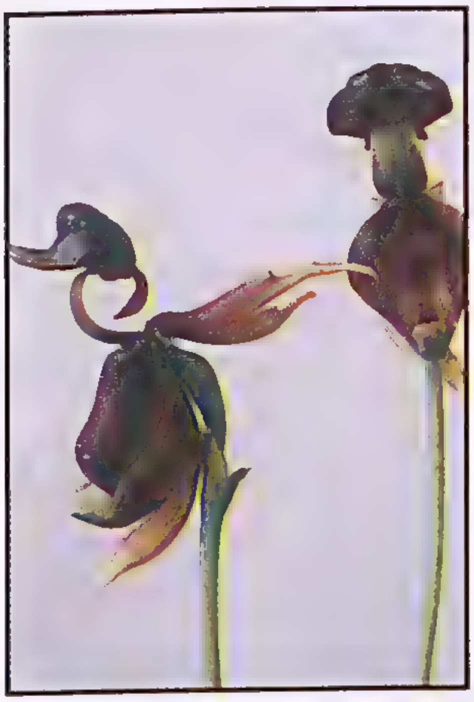


Plate 5: *Caleana major.*

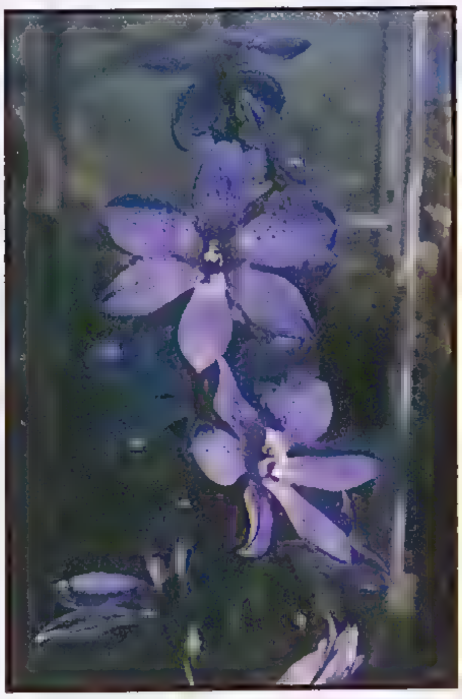


Plate 6: *Thelymitra ixioides.*

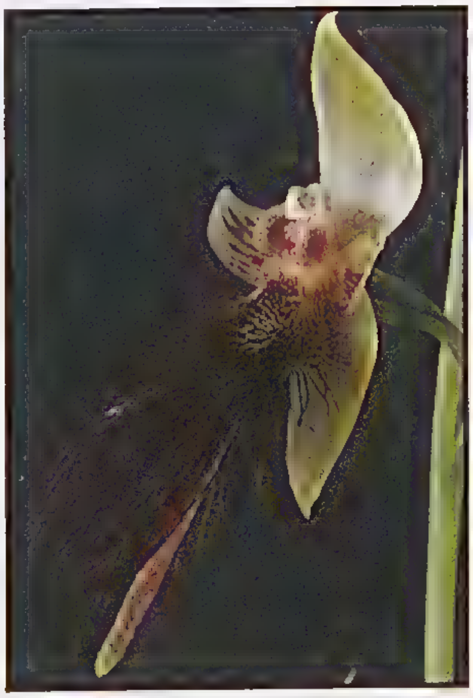


Plate 7: *Calochilus robertsonii.*

Photos by W. T. Upton.

stems to photograph and they lasted in water for over six weeks in good condition, the labellum opening and closing many times during each day. (Plates 3 and 5). Unfortunately since our bushfires this area has been slashed as it was very close to houses, last year only three plants came up. It commences flowering about mid-October.

The epiphyte *Cymbidium suave* is represented by two plants growing low down, about eye level, in the crotch of Eucalypt trees, very close to the fire trail around the outside of Kariong and within 50m of houses. One plant (Plate 1) had 13 racemes of highly fragrant greenish and brown flowers. It began flowering on 17th October last year and was still in flower one month later.

In mid-November a large colony of 50 or more *Cryptostylis subulata* (Plate 2) came into flower and continued flowering until at least late February when we last looked at it, but it was failing then. The flowering stems were about 45cm high with only one or two flowers out at any one time. It was on the edge of the fire trail but in dense scrub.

In early January this year we saw two plants of *Dipodium variegatum* in fairly dense bush. This leafless terrestrial saprophyte was about 22cm high and carried about 16 creamish flowers with dark purple blotches.

Two *Prasophyllum* species were seen in April in a lightly timbered area. The "Fringed Midge Orchid", *P. fimbriatum,* whilst small, is a most complex flower. The flower stem is approximately 30cm long and bears up to 30 hairy flowers each about 5mm across. The lip which is fringed with long purplish hairs, trembles in the breeze. In warm weather it emits a delightful lemon fragrance. No doubt the fragrance and tremulous lip attracts insects, possible hover flies, to effect pollination.

The other *Prasophyllum* was possibly *P. nudiscapum,* but the flowers had closed and like this species were nodding at this time. I hope to see it again this year.

Pterostylis daintreana was found in mid-July, only one flower stem was seen, growing in low bush in a thin layer of soil over a sandstone outcrop. The stem was about 30cm tall and carried six flowers, although when I saw it, five were brown and dying (Plate 4). On the stem were three sheathing leafy bracts. This is mostly a solitary species, I have seldom seen more than a few plants growing in close proximity to each other. *Pterostylis* is, to me, one of our most beautiful and unique genera of orchids, no doubt this accounts for it being one of the best known as well as very popular. The genus comprises in the vicinity of 130 species and due to their shape commonly called "greenhoods".

I only grow a few terrestrial orchids and this is mainly because when I see a particularly lovely species on the sales table at a local native orchid show, and am tempted, I buy it. Always on getting it home, I go immediately to *Cultivation Of Australian Native Orchids* produced by A.N.O.S. Victorian Group Inc. and written by greatly experienced growers. This tells me all I want and need to know about the cultivation of terrestrial orchids, including potting media. It covers epiphyte culture as well. See the A.N.O.S. advertisement at the rear of this issue. ✤

CHARITY FESTIVAL OF
AUSTRALIAN NATIVE ORCHIDS

OPEN DAY & SHOW

Sunday, 6th October, 1996

Dayboro Community Hall
Bradley Street, Dayboro, Qld.
Benching 7.00 a.m.
Open to Public 10.00 a.m.–4.00 p.m.
Information sessions and potting demonstrations.
Show sponsor: Frank and Bev Simpson.
Phone: (074) 98-2185

Reprinted from the *Sydney Morning Herald*, 15/2/1996.

PLANT RESCUE SQUAD UNEARTHS BLOOMING UNDERGROUND MARVEL

By Bob Beale
Science and Environment Editor

When Ms Mikla Lewis went to save native plants from a building site in the Blue Mountains, her digging unearthed one of the world's rarest and strangest living things.

She was removing another plant when her gardening fork exposed a narrow white tuber — and a half-remembered reference in a botany book made her think it was something special.

So she and other volunteers from the Blue Mountains Wildplant Rescue Service carefully removed it.

Botanical experts have now confirmed that the find was an eastern underground orchid, *Rhizanthella slateri,* a unique Australian plant rarely seen before and known today only from a few individuals living at just two sites, both in coastal N.S.W.

This poorly understood orchid is "one of the world's most specialised plants", notes Mr David Jones, a research scientist at the Co-operative Research Centre for Plant Biodiversity Research.

The centre is now using the find to start the first attempt to propagate the orchid, which lives almost entirely underground as a lifelong parasite of a fungus.

The new specimen had just finished flowering and is going to seed, but with so little known about its biology, Mr Jones says breeding it could be a hit-and-miss affair.

According to Dr Peter Weston, an orchid botanist at Sydney's Royal Botanic Gardens, the only time any part of the orchid emerges from the soil is in spring, when a small flower head bobs out into the surface leaf litter. Even then, the cluster of purplish flowers may be a few millimetres below the surface, he says.

The orchid must pace its growth to that of the fungus — which probably lives inside special cells in the tubers — in a mutual co-existence that, barring disease or mishap, may be indefinite.

"They are in principle immortal", said Dr Weston.

Its better-known relative, the western underground orchid, lives in a three-side relationship with a fungus that grows only at the base of a species of melaleuca bush.

Its flowers are pollinated by termites attracted to their pungent smell.

Perth botanists managed to propagate it only by recreating its "love triangle" in a flask of nutrients containing the orchid's tiny seeds, the growing fungus and a melaleuca cutting.

Ms Lewis — who was also a founder of W.I.R.E.S., the voluntary wildlife rescue and information group — says the plant rescue service has an agreement with Blue Mountains City Council, which provides advice of successful building applications.

The service then seeks permission from applicants to visit the site first to dig up small plants or collect seeds and cuttings from larger ones in order to conserve them.

"This amazing orchid would never have been found if we weren't there rescuing plants", she said yesterday. "It shows the importance of the work we're doing".

"We hope this incident will make people more aware of the uniqueness and diversity of our plant life". ✾

THIRD AUSTRALASIAN NATIVE ORCHID CONFERENCE AND SHOW — FLINDERS UNIVERSITY, ADELAIDE — 26th TO 29th SEPTEMBER, 1996

It is now less than four months until the **Third Australasian Native Orchid Conference and Show** will be held in Adelaide at the Flinders University. The Native Orchid Society of South Australia (N.O.S.S.A.), host of the third Conference on behalf of the 25 Native Orchid Societies that constitute the Australasian Native Orchid Society (A.N.O.S.), has been working hard toward ensuring that the Third Australasian Native Orchid Conference and Show, will be long remembered as one of the most impressive and most significant Orchid Meetings ever staged in Australia. The 25 Australian and New Zealand groups will together bring to Adelaide what is expected to be the largest and the most innovative and spectacular display of Australasian native epiphyte and terrestrial orchids and their hybrids ever assembled, with all areas of the Australasian region represented. Field trips will allow conference delegates to see a large variety of South Australia's terrestrial orchids in their natural settings. Speakers of the highest calibre will deliver up-to-date papers on an exciting range of topics, over a full two day period. The Australasian Native Orchid Conference and Show is offered only every third year and should not be missed! N.O.S.S.A. looks forward to providing a warm and genuine South Australian welcome to delegates from around the world. The Who's Who of Australasian native orchid experts and enthusiasts will all be attending the Conference.

Speakers from Australia, Papua New Guinea and New Zealand have been selected on the basis of specific expertise and public speaking ability. Speakers include David Banks: *One Day Wonders and Rarely Seen Australasian Orchid Species;* Heinrich Beyrle: *Soil pH in Habitats of Terrestrial orchids;* Andrew Brown: *Aspects of the Biology and Ecology of Western Australia's Native Orchids;* Malcolm Campbell: *Hybridising Between Australian and New Zealand Genera;* Mark Clements: *Australian* Dendrobium *Taxonomy;* Lorraine Fagg: Sarcochilus *Species in the Wild and the Latest Hybridisation;* Don Gowanlock: *Virus in Australasian Native Orchids;* Ted Gregory: *Hybridising with* Dendrobium *Willowie Gold;* Wayne Harris: *The Evolution and Distribution of the Australasian Orchids;* Neville Howcroft: *An Introduction to Papuasian* Spathoglottis; Bruce Mules: *Growing Native Orchids in Arid Areas;* Les Nesbitt: *Conservation of Orchids on a Bush Block;* Andrew Perkins: *The Systematics of the Genus* Calochilus; Helen Richards: *You can have a Darn Good Collection of Species Terrestrials;* Daryl Smedley: *Miniature Orchids of Australia;* Phil Spence: *Australasian species – Hybridising with New Guinea Dendrobiums;* Geoff Stocker: *Selected orchids of Papua New Guinea – Notes on Habitat and Cultivation;* Walter T. Upton: *Hybridising with the Genus* Dendrobium *in Australia;* Ron Heberle: *Caladenias and their Putative Hybrids of Western Australia* and John Woolf: *Recent Trends in Novelty* Sarcochilus.

September is the best month to see native orchids in the bush near Adelaide. Some 100 species of terrestrial orchids occur in the Adelaide Hills area, making it one of the richest orchid areas in Australia. Local experts on South Australia's native orchids have offered their services as field excursion guides. Two formal excursions are being organised and many very exciting terrestrial orchid species will be seen. Additional informal outings, both before and after the Conference, are also being arranged

A photographic competition is being held in conjunction with the Conference and Show. All entries will be displayed at the Conference in a room specifically designed for such displays. Wouldn't it be great to have every Australasian orchid species represented in one form or another at the Conference! Paintings, ceramics, woodcarvings and other high quality crafts depicting native orchids will be placed on display alongside the photographic entries. N.O.S.S.A. is finalising other displays and events that will add considerably to the enjoyment of the Conference. We would love to hear from you if your are able to contribute in any way or if you have any ideas that may lead to an improvement of the Conference.

The conservation of our native orchids will be a much promoted theme of the 1996 Conference. it is hoped that Conservation Officers from all A.N.O.S. associated/affiliated societies will meet in Adelaide to maintain a conservation purpose and solidarity at national and international levels. A conservation forum is planned for the Saturday morning of the Conference and a boardroom has been booked in which conservation issues may be discussed throughout the Conference period. Letters have recently been sent out to A.N.O.S. Conservation Officers seeking both support of and ideas for the forum. Industry and government participation, sponsorship and support are being sought.

Some great news is that Dr Barbara Hardy, A.O. has agreed to open the Conference for us. This is indeed a great honour for both N.O.S.S.A. and for A.N.O.S.! No one has a busier schedule than Dr Hardy and she has had to cancel another very important engagement to be with us.

There are other good things happening as well:–

- The Adelaide Botanical Gardens/State Herbarium will assist us in putting together a special display of the more historical aspects of native orchids in South Australia
- John Riley will have up to three displays (*Chiloglottis*, the *Caladenia dilatata* complex and *Pterostylis longifolia*), each comprising about 20 of his outstanding botanical drawings, showing the variances that occur in certain orchid species/complexes in different localities around Australia
- Ron Tunstall, considered by many as Australia's foremost photographer of native orchids and an excellent speaker, will give registrants an intriguing look at *Diuris*, using 35mm slides
- Ron Heberle, a man with an outstanding knowledge and understanding of Western Australia's native orchids, will have a very large and very impressive photographic display of Western Australia's orchids
- We are working on putting together special exhibits showing native orchids from both Papua New Guinea and from New Zealand, regions in which a large number of live plants will not be available for the Conference. The individual displays will be a combination of live plants, photographs and 35mm slides
- There will be continuous showings of 35mm slides (we hope to have several projectors set up) and videos, of Australasian native orchids
- N.O.S.S.A. Life Member, Don Wells, has crafted, from large cuts of redgum, a spectacular Conference Totem that will be garnished with orchids and ferns and will act as the perfect entrance to the native orchid show
- There will be a large trading table/sales area, with many interstate nurseries and other vendors represented
- A display showing some of the modern laboratory techniques such as flasking, that are being used in the culture of native orchids
- We are hoping to have "Meet The Author" and "Meet The Artist" sessions in order that registrants may meet and talk to the "celebrities" themselves
- A display of *Rhizanthella gardneri* with actual preserved plant
- A Conference Icebreaker Evening, a conference Presentations Dinner, A Conference Badge, other Conference momentos
- and there will be more and more and more!!!

Further information may be obtained through writing to the **Conference Committee, N.O.S.S.A., P.O. Box 565, Unley, S.A. 5061 or by phoning Gerry Carne (08) 332-7730.** ✻

MISCELLANEOUS MINIATURES

Roy Gifford
2 Warrah Street
Ettalong, N.S.W. 2257

Acriopsis javanica Reinw. ex. Bl. in Bijdr. Fl. Ned. Ind. 377, 1825. (Plate 13, Fig. 5)

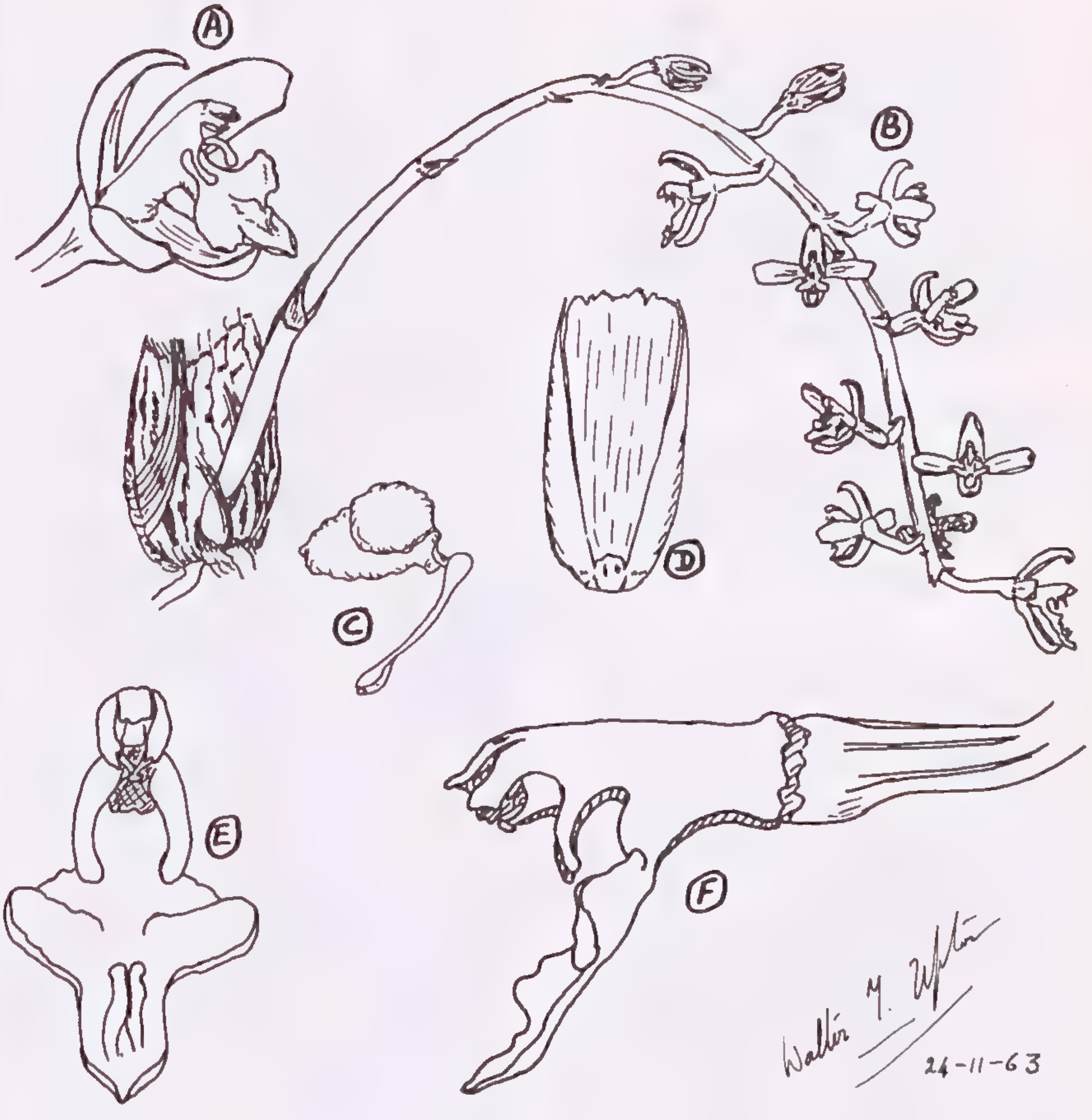
This little guy has wandered down into Cape York from New Guinea and is found growing naturally there from around the Daintree River north. It is an epiphyte which favours paper barks in rather exposed areas and is an orchid which has adopted the "litter nest" method of conserving moisture and gaining extra nutrients. The plants grow rather thick conventional roots which, in nature, usually penetrate the bark of its host and then grow many other more slender roots as branches of the mains. These branches grow upright and, in turn, branch, forming an intricate trap for falling leaves, bark fragments, insect bodies, etc. which serve the double purpose of holding moisture — especially in the dry season — and providing food via the decomposing organic material in the trap.

The plant has rather tough fibrous pseudobulbs 2–5cm tall by 2–3cm across, slightly flattened and clustered with no visible rhizome. They are ovoid, yellow/green in colour and have 2–4 leaves near the apex of the growth. Leaves are 5–15cm long by 1–3cm wide, thin and tough, pale yellow/green in colour with a pointed tip and have tight sheaths clasping the upper pseudobulb.

The inflorescence appears from the base of mature growths and is a many branched panicle 25–70cm long, usually arched under the weight of the very many tiny blooms. I never counted the blooms on a large panicle but Alick Dockrill states "containing up to at least 200 flowers" and I do not doubt it. The flowers are small, 6–7mm across, widely opening with the sepals and petals much the same length. The dorsal sepal and the petals are oblong with rounded tips, about 2mm across, the lateral sepals joined along their inner edges and tucked behind the labellum. The labellum is straight and stiff with two prominent side lobes and two large calli. There are two long thin arms on the column, just above the apparent base of the lip and a vertical tube below them, this formed by the joining of the lip, on each side, to the bottom half of the column. The column also has two prominent wings at the top. A most complicated part of the wee flower.

The species is a true tropical grower, never far from sea level and fifty years ago I grew it in a well lit and breezy bushhouse, just tied to a piece of tea tree limb with the bark intact and hung at an angle of about 45 degrees, the plant uppermost. At Ettalong it was not quite so easy, plants requiring a winter temperature of at least 12°C. Here I potted some as I would a *Bulbophyllum,* in shallow terracotta drip trays with many 10mm holes bored in the bottoms and a generous layer of old broken brick for extra drainage. I used a compost of medium and small grade radiata pine bark — pretreated — about 50–50 by volume, added chopped sphagnum moss to increase the volume by about one third and to every 20 litres of this mix a double handful of hoof and horn. I mixed this brew while damp, stirred it well and left it to simmer for a couple of weeks before I used it and found it a good compost for my conditions. I used to keep plants just damp in spring and summer, feeding with very weak supplements about once a week.

During cool weather I withheld water almost entirely, relying on the humidity in the house to supply the limited needs of plants at this time. Perhaps, if we had a dry winter, I would water plants twice, picking the morning of a fine clear day. I also grew a few plants mounted on old weathered hardwood palings, cutting a chunk some 20–25cm long by about 15cm across. I would bore two holes in each end of these slabs and attach bridles of copper wire so that I could hang the plants horizontally, or nearly so. I had hooks of differing lengths and could raise or lower them as I decided and I would lift them clear of random watering in cool weather, up into the higher areas of the house where they got about 40% shade. These slabs were fed while growing



Walter M. Upton
24-11-63

Fig. 5: *Acriopsis javancia* Reinw. ex. Bl.

(A) Flower, side view, 2.5X; (B) Pseudobulb and small inflorescence, 1X; (C) Pollinarium, approx. 20X; (D) Lateral sepals, 5X; (E) Column and labellum, front view, 5X; (F) Column and labellum, side view, 5X.

by my tossing 5–6 chook pellets into their nests, plus my regular liquid feeding, with no extra food while resting. I would also toss a few dried fern fronds into the nest in warm weather.

I always watered the warm house in winter in the early morning and then only if weather was fine, so I watered the slabbed plants with everything else. Their drainage was perfect and I had no problems from doing this. Plants multiply, but not very rapidly, so it takes a while to get specimens with a few panicles, but when one does the plant is quietly handsome. Flowers are pale creamy yellow, the lip always white on plants I flowered. Flowers appear in late winter and early spring and last a week or so.

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Dockr. in Aust. Indig. Orch. Vol. 1. 616–617, Fig.
Jones in Nat. Orch. Aust. 590–592, Fig. Col. Pl. 1988.
Clements in Aust. Orch. Research. Vol. 1. 10, 1989.

Flickingeria comata (Bl.) Hawkes Orch. Weekly 2:453, 1961. (Plates 10 and 12). Synonyms many, see references.

This is not a species for the grower in temperate climes with a small glasshouse, unless one is prepared to give over a goodly part to one plant. A well grown and adult plant takes up a considerable amount of room and is hard to contain without making the plant look a mess. I grew plants from Indonesia and Malaysia long before I managed to get a couple of clones of our native, but I confess that if I had got my labels mixed I would have been hard pressed to identify the plants as there is little difference in growth or flower, despite its large range.

Our plants are obviously migrants from New Guinea and I was never lucky enough to get a clone from there, but I would hazzard a guess that they too are much the same. The plant has long aerial stems which come from basal eyes, the root growth confined to this basal area, the stems having no roots. Pseudobulbs are quite large — up to 15cm long — close to the base, with leaves also large on these growths. The early growths are some distance apart, but as the stem elongates, this distance lessens, the pseudobulbs get smaller and so do the leaves, until the stem reaches maturity at around 100cm, the terminal growth only a few centimetres from the one beneath, the pseudobulb as small as 5–6cm, while the sessile leaf — as large as 20cm by 8–9cm on first growths — shrinks to 5–6cm by 2–3cm, the shape remaining constant as an elongated oval. The stems occasionally branch, but with me this was not common, the plant increasing by new growth from the base so that each plant would have several stems at different stages of growth at any given time. Plants will flower from the first made growth when it matures and from every other one as long as they stay healthy.

The flowers appear from dry brown sheaths at the top of the mature growth and may have up to a dozen at once from the same growth. There does not seem to be any particular flowering season, blooms appearing at any time as growths mature and growths with healthy leaves will flower more than once under some circumstances. It seemed to me that if a growth got a lot of blooms first blooming it would not bloom again, producing maybe 10–12 flowers, but if there were only 3–4 flowers, the growth would flower up to three more times, with a possible yield of 16 flowers — all depending on the leaf remaining healthy. I never had a flower from a pseudobulb which had lost its leaf, even if this happened before the growth had flowered at all. I know — one should not lose the leaf so early but it does happen, even to the best of us, that a grasshopper dines well or some such and the young leaf is kaput — then so are the flowers, in my experience. The smaller the growth of course, the less flowers, so the terminal growth might only have 2–3 blooms.

Flowers are 2–3cm across and open widely, the sepals much the same length — 8–12mm — with the dorsal perhaps slightly wider at 4–5mm. The laterals are close to 180° apart with the lip on the same plane, so flowers are very triangular. Petals are very narrow, only

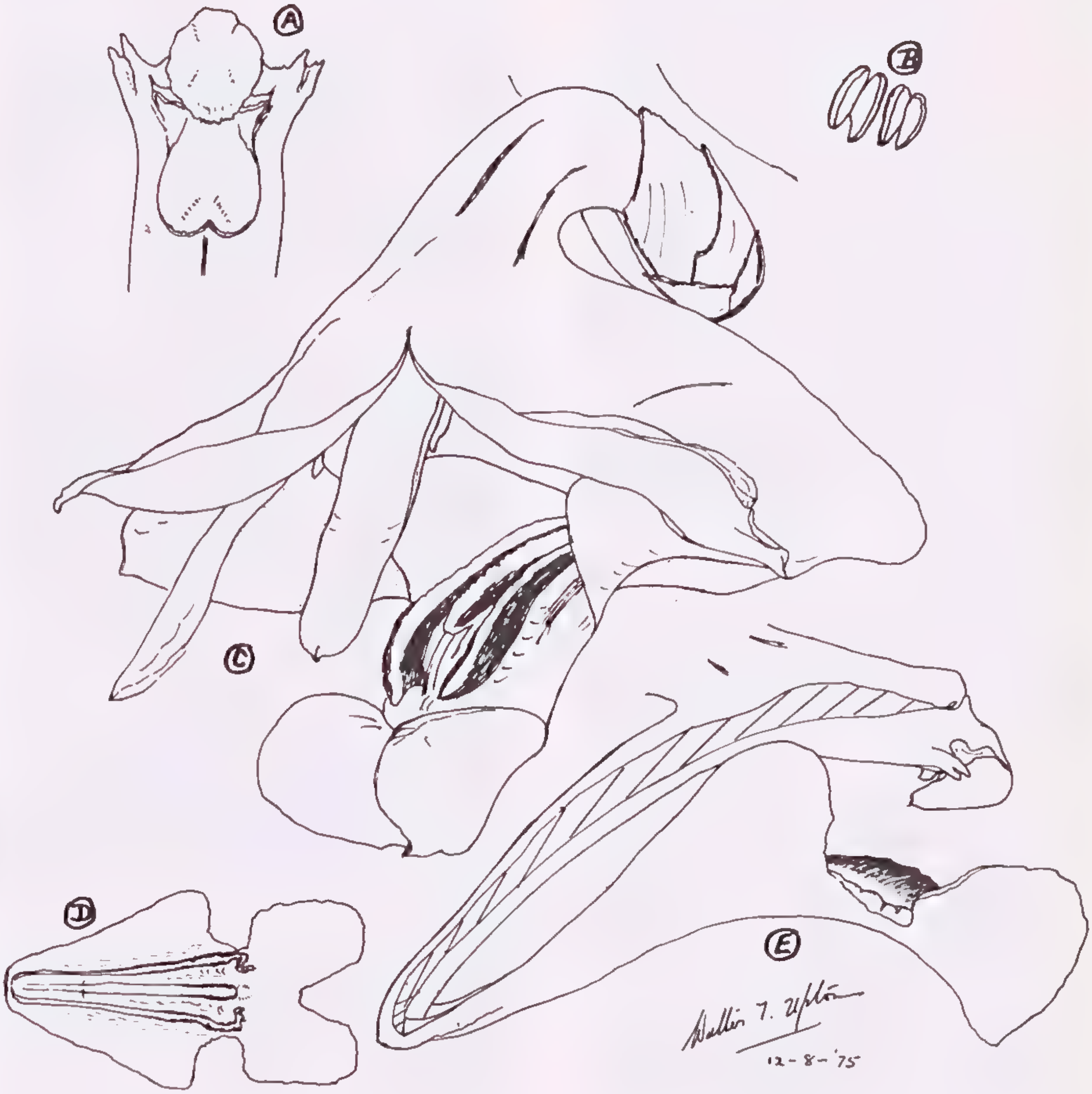

Fig. 6: *Flickingeria convexa* (Bl.) Hawkes

(A) Column, front view, 10X; (B) Pollinia, approx. 10X; (C) Flower, 10X; (D) Labellum, pressed flat, 4X; (E) Column and labellum, side view, 10X.

1–2mm wide but about as long as the sepals, bisecting the angle between the dorsal and lateral sepals. The lip is quite intricate, about 12–15mm long by 5–6mm across the side lobes when flattened. It reflexes gently at first and then levels out toward the end of the mid-lobe, with two prominent ridges down the centre which get the staggers on reaching the mid-lobe and wiggle for awhile, straightening out just before they reach the tip. The side lobes are quite pronounced and the apical half of the mid-lobe has margins densely lined with short curly hairs. The sepals and petals are pale yellow with pale purple spots, the lip with the side lobes purple and the hairs also purple. Quite striking really, but I know growers who have flowered plants for a long time and never seen them flower, for the plant has one small drawback — the flowers lasting only a few hours, opening about 9.00 A.M. and closing around 3.00 P.M. — the trick is to get a job on night shift.

Under cultivation I grew this species in Townsville fifty odd years ago just tied to an ironbark post which was a corner post of our bushhouse, in a position where it got lots of light and moving air and fed with liquid cow manure about once a week, watering every day. There, the plant flourished and was seldom without flowers, which I would sometimes see on weekends — I was still a schoolboy then. At Ettalong many years later, I found it was not quite so easy, for plants die very rapidly outside if temperatures drop below 12°C. In the warm house I strapped plants to banksia branches about 10–12cm in diameter and 30cm or so long and used Thailand or Indian moss as a backing to give the plant a bit of moisture at the start. I used to get a lot of moss from India and Thailand, for I asked all my suppliers in those countries **not** to tidy plants they sent me and any moss not used immediately was tied to slabs and hung in odd corners of my warm house to multiply. Came in handy for all sorts of plants. Mounted plants were hung in 50% shade, usually against the western wall where they got the morning sun and fed with weak nutrients every second watering. Fans were running always and I never let the poles dry out completely, watering every day in spring and summer, easing to twice a week in the cooler periods. Treated thus, I found the species not unduly difficult to grow, the main problem being the plants desire to take the place over when they got the bit between their teeth. The stems start out growing upright but as they get more growths the weight bends them over and out and stems a metre or so long curving out over the benches do pose a few problems. Fortunately one can control the spread a bit, since a stem which has exhausted its flower eyes may be neatly removed close to the base without hurting the plant. I never had such a stem get any aerial growths or contribute to the general welfare of the plant and by the time it has finished blooming there should be several other growths in various stages of development to maintain the health of the plant, so it may be safely removed. Stems can be held upright a bit by training them through a hoop of stiff copper wire attached to the top of the pole, but this is only a partial solution — they will still bend — and the plants do not look natural, so I abandoned that idea after a trial.

Not a plant for a small warm house, but if one has a bit of room and can tuck a pole in a corner in good light, one that is deserving of a place in a collection of Australian orchids, even in a warm house. Should be no problem in a bushhouse in tropical lowlands, given the normal treatment all plants in uncontrolled environments require.

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Clements in Aust. Orch. Research. Vol. 1. 80, 1989.

Flickingeria convexa (Bl.) Hawkes Orch. Weekly 2:454, 1961. (Plates 8 and 9, Fig. 6). Synonyms: See references.

This is another tropical lowland orchid which is widespread to the north of Australia as well as Indonesia and Malaysia, that I know of, for I had many plants from those two areas and probably New Guinea also, though I have no knowledge of plants from there. It would seem logical though that our native population came down via New Guinea.

While I had a lot of exotic clones I only ever had one from Cape York, a plant I got from a mate in Cairns many years ago, said to grow on mangroves near Hopevale Mission. This would be close to the southern end of its Australian range as I understand it. There is little variation in growth or floral colour, in my experience, in plants from all areas I had represented in my collection.

The plant has a tough woody rhizome some 2–3mm in diameter which branches vigorously on strong plants, but which has to be handled with care when bare rooted, for this rhizome, while quite hard to break, will snap at the junction of the growth base if one sneezes. The pseudobulbs are 2–8cm apart, the roots many and springing from all along the rhizome, forming a dense mat. The pseudobulbs are very slender at their bases for the first 4–5mm, then expanding to an elongated oval 10–50mm long by 5–12mm wide, which is flattened and 4–6mm thick. It is plump and shining pale green when young but becomes dull and furrowed as it ages. The single terminal leaf has a petiole of 3–4mm, the blade tough and coriaceous, 20–60mm long by 8–20mm wide, oval with a slightly uneven rounded tip.

The flowers appear from the top of the pseudobulb, usually only one, but occasionally two — never more on plants I flowered and on my plants the growths flowered only once. The pedicel plus ovary is 6–8mm long with the flower above the rather long mentum wide spreading, some 5–9mm across by 15–20mm long, usually non-resupinate but not always. On all the clones I flowered and I had about 50 at one time, the flowers were cream to light yellow with the mid-lobe of the labellum darker yellow and a red spot above it. The native clone had cream flowers with the yellow and red markings. The mid-lobe is notable, for it is almost circular and deeply cleft for its length. Blooms appear from any mature growth at any time and since plants get many branches which make 3–4 growths each year, there is seldom a time when there are no flowers, especially if one has a few plants. Blooms last less than a day, opening around mid-morning and closing 4–5 hours later. Again a plant for the night shift and very hard to win prizes with at monthly meetings.

This is a warm grower anywhere out of the tropics and needs an absolute minimum of 12°C. in winter if it is to grow at all well. In my warm house I grew plants tied to slabs of tree fern fibre 30cm long by 12–15cm wide and tried to hang them where light was about 50% shade and even all round so that plants could crawl around the entire slab. I used to put a layer of moss under bare rooted plants as a backing, fed every second watering with weak nutrients, had air moving gently always and never let slabs dry out. If one keeps the moss bright and green, but not dripping, plants are getting the right amount of water. Growth would slow a little in winter and I would then reduce feeding to once every ten days or so. Not a species to win ribbons with, but unusual and ever flowering if grown well and worth a place in the collection of miniatures.

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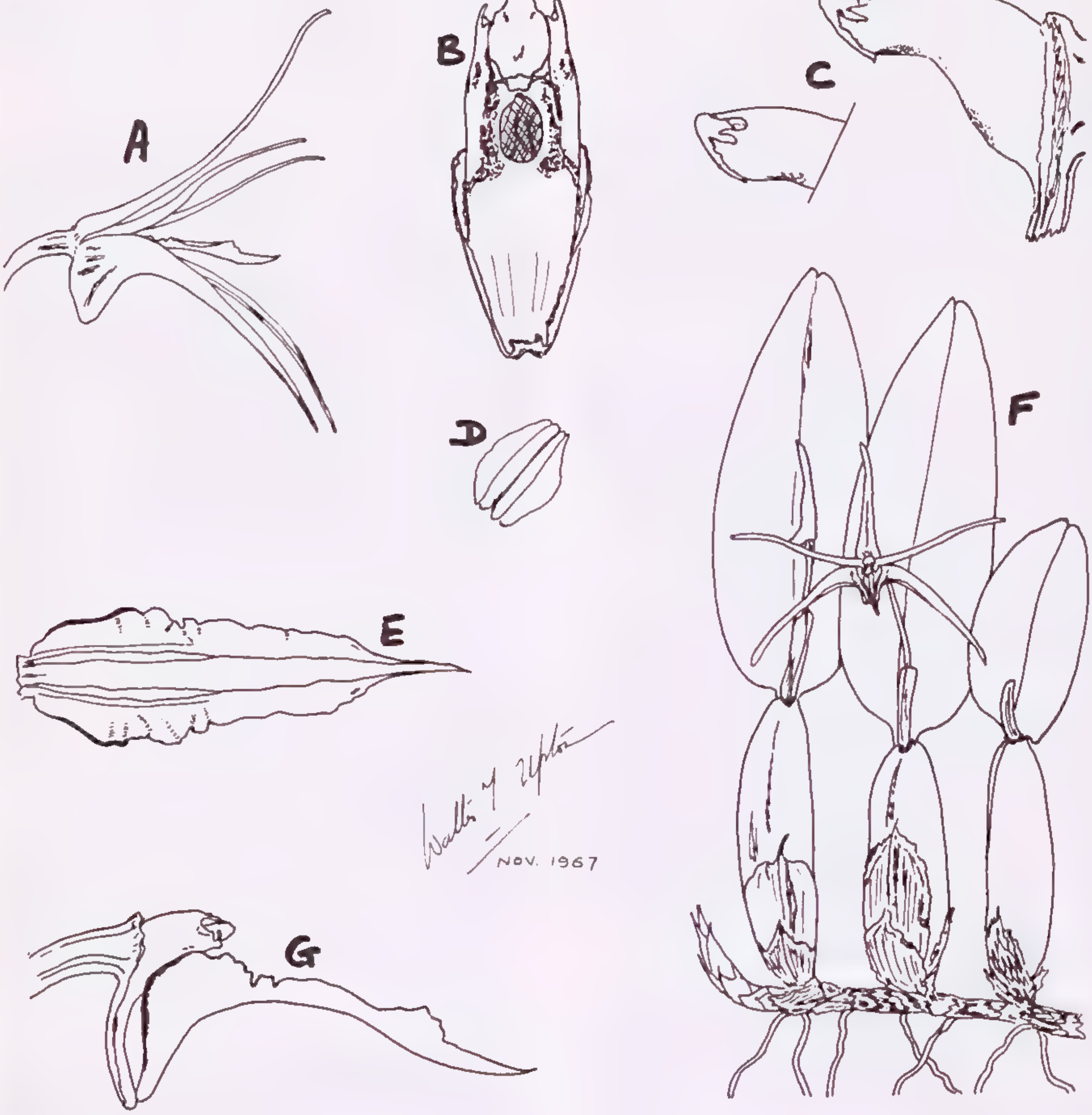
Diplocaulobium glabrum (J.J.Sm.) Krzlin in Pflanzenreich. Heft. 45:339, 1910. (Plates 11 and 14, Fig. 7). Synonyms: See references.

This is a delightful miniature which has come down from New Guinea to grace our orchid population, being found in lowland areas of eastern Cape York between the Barron and Mulgrave Rivers (Dockrill, 1969). I have never seen plants in the wild but am told they form large mats on trees in rather open areas near rainforest. I had quite a few clones sent to me at one time by a collector in Cairns and they did form large mats in my warm house.



Walter T Upton
NOV. 1967

Fig. 7: *Diplocaulobium glabrum* (J.J.Sm.) Krzlin.

(A) Flower, side view, 2X; (B) Column, front view, 8X; (C) Column, side view, 8X; (D) Pollinia, approx. 8X; (E) Labellum, pressed flat, 4X; (F) Plant, 1X; (G) Column and labellum, side view, 4X.

The rhizome is stout and woody, 4–5mm in diameter, with many stiff sheaths which turn brown and persist when dead. The pseudobulbs are close together, 10–12mm apart and are protected as they grow by a couple of large bracts which also turn brown and dry — and persistent — when they die. These dead bracts should be watched, for they provide shelter for all sorts of bugs and may need to be **carefully** removed if unwelcome tenants move in. The pseudobulbs are short and fat, shining yellow/green, 15–50mm tall by 6–15mm across the base, slightly flattened and 5–12mm thick just above the base. They taper smoothly to the blunt tip. The terminal leaf is tough and leathery, 20–70mm long, dull yellow/green and expands rapidly at first, to 10–20mm across at its widest, then tapering evenly to the rounded tip. There is a pronounced mid-rib. Mature growths have a persistent sheath at the pseudobulb top which protects the emerging buds. **Never interfere with this sheath.** Flowers are held clear of the leaves by a strong wire like pedicel 30–35mm long, including the ovary. Blooms may appear at any time, mostly only one at a time but occasionally two and open widely, about 30mm across the extended petals. All segments are long, about the same length and very narrow, the flower is pale yellow or cream, at least on clones I flowered, lasting only a few hours. I have no idea how many buds there are in any one sheath, but growths will flower at intervals for months, producing at least 6–8 blooms from the same growth — as long as it has a healthy leaf. I know of very few species orhids which will flower from leafless growths, bar those which are naturally deciduous.

Under cultivation I grew plants strapped to various slabs, ironbark, old weathered hardwood palings, banksia branches with the bark on and tree fern and found the old palings worked best for me. All **plants** were given a layer of moss as a backing when first mounted, kept always damp, fed every second watering with weak nutrients during warm weather and about every 10 days in cool conditions. I gave about 50% shade, had air moving always and kept a winter temperature of minimum 12°C. I had a couple of clones from Indonesia and the only difference I could see was that the exotic plants were noticably larger, though there was little difference in flower size. Once established, happy plants will branch freely and make 3–4 growths each year, so it does not take long to grow a specimen which will rarely be without a flower or 10. Another species which will earn no prizes at monthly meetings, but the flowers are quietly beautiful and when one retires they can be admired every day of the year if one has a specimen plant or two. Grows like a weed in well lit bushhouses in tropical lowlands and as a youth I had a couple of large mats on the ironbark posts in our bushhouse at Townsville which spread around the posts — 20cm diameter — and climbed up and down. They covered about two square feet when I left them for a woman and got married. Missed those plants for a long time!

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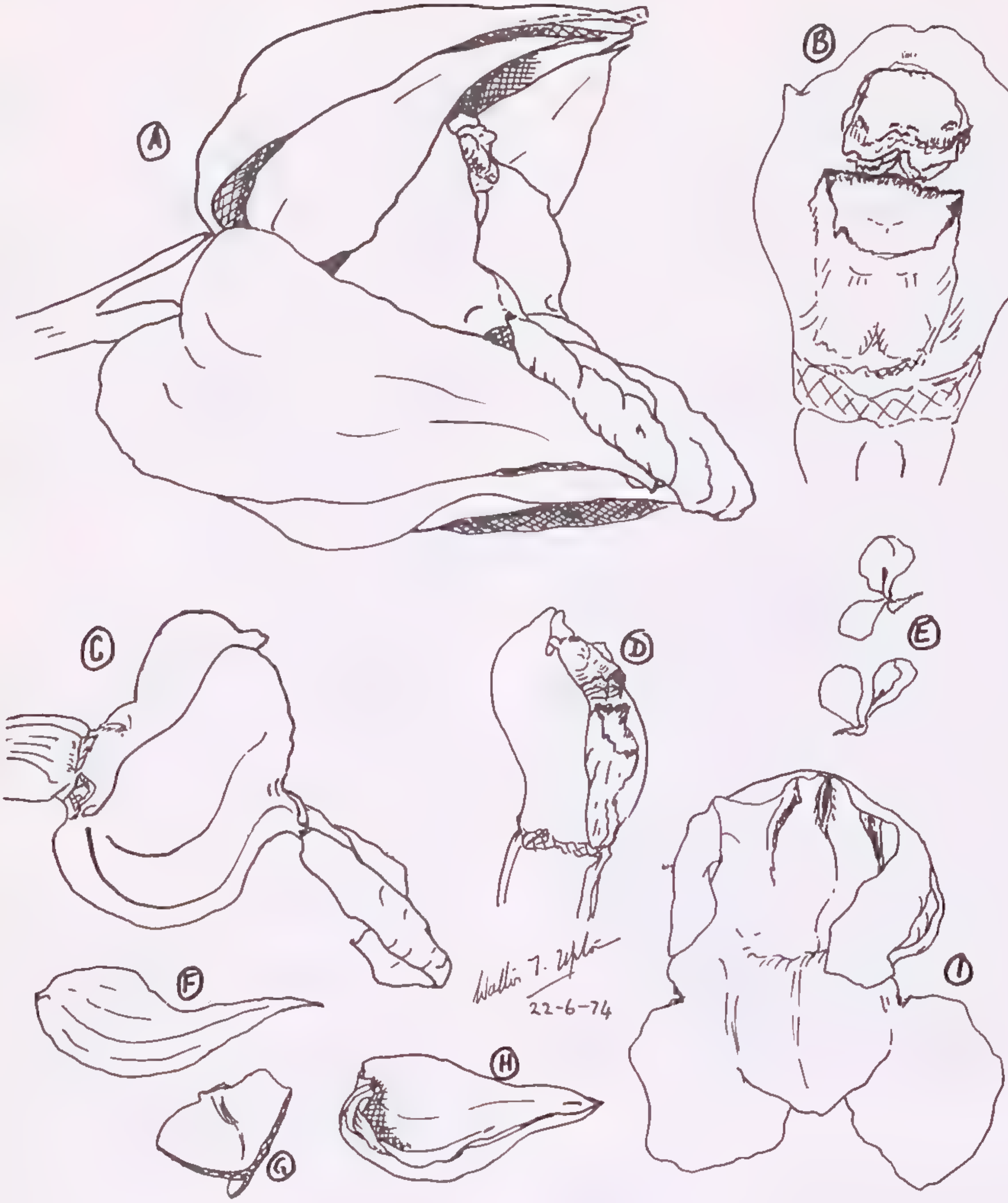
Jones in Nat. Orch. Aust. 499–500, Fig. Col. Pl., 1988.

Clements in Aust. Orch. Research. Vol. 1. 65, 1989.

Pholidota imbricata Lindl. in Bot. Reg. 14:t. 1213, 1828. (Plates 15, 16 and 17, Fig. 8).

This chap can grow into a very large clump and used to be common as an epiphyte or lithophyte in rainforests, from around Townsville north, along the eastern ranges below 1,000m. It likes pretty shady areas and I have found hundreds of plants all along the ranges in my salad days, usually on main branches of trees if epiphytic or large mossy boulders as lithophyte. It has a wide range through New Guinea, Indonesia, Malaysia, Burma and southern China and I even had a few plants from nurseries in Thailand, though these were probably collected in Burma by collectors who did not worry too much about political borders.

The pseudobulbs are closely crowded, with no obvious rhizome, the pseudobulbs soft and



Waltin T. Upton
22-6-74

Fig. 8: *Pholidota imbricata* Lindl.

(A) Flower, side view, 10X; (B) Column, front view, 12X; (C) Column and labellum, side view, 10X; (D) Column, side view, 8X; (E) Pollinarium, approx. 12X; (F) Petal 6X; (G) Cross section through sepal, 4X; (H) Lateral sepal, 4X; (I) Labellum, front view, 10X.

fleshy, pear shaped or cylindrical, 5–8cm tall by 2–5cm across the base, dull grey/green in colour, usually smooth but they will furrow if deprived of sufficient water. The single terminal leaf has a petiole 2–4cm long, very strong and channelled, the blade thick and tough, heavily pleated and dull green in colour, 30–40cm long, held upright and oblong in shape with a blunt tip. The growths are protected as they develop by 3–4 large sheaths which soon decay, while the roots are many, quite thin and wiry.

The inflorescence is produced as the young growth develops — synanthous — and is protected by it. The peduncle is strong and wiry, generally upright until the weight of the rachis pulls it down a bit. The inflorescence is terminal on the growth, 20–50cm long, about one third being the rachis with up to 50 small flowers 8–9mm across. The flowers are usually in two parallel rows, all facing the same way, but occasionally plants will flower with the blooms in spiral rows or half and half with blooms changing their arrangement in mid-rachis as it were. The floral bracts are large and a disadvantage, for they are persistent, go brown as they die and detract from the appearance of the flowers. Flowers are almost round in outline with the dorsal sepal and petals hooding the column, the laterals broad and spreading. The labellum is cup shaped, the edges upturned all round with two indentations toward the front forming a sort of chin. Colour is usually dull white or cream, but occasionally one strikes a clone with paler sepals and petals with purple tonings — these are most attractive. Flowers have no perfume and last 10–12 days.

Under cultivation plants grow well in pots, terracotta for preference, with a generous layer of broken brick or some such as additional drainage and the bottom drainage hole enlarged. I used a compost of medium grade pretreated radiata pine bark with a little vermiculite — about 25% by volume — and added a double handful of hoof and horn to every 20 litres. Mixed damp and allowed to brew for a couple of weeks before using, I found this was very good and plants responded well and quickly, complimented by liquid feeding. In the tropics, lowland bushhouses are sufficient and plants will do well, but in cool climates the species needs some additional warmth in winter and a minimum temperature of 12°C. is essential. Healthy plants will expand rapidly for they get many multiple growths and eventually need largish containers, but they should not be over potted, so I used pots large enough for two year's growth and potted on as required. Treated thus I found plants would grow into specimens in a couple of years and produce up to 20 racemes during autumn each year. I gave 60–65% shade, for the heavy foliage burns in bright light, had fans running at all times, fed every second watering with weak nutrients and tried to keep pots just damp. This can be achieved by allowing them to reach the just damp stage and then saturate watering and waiting for the damp stage before watering again. Timing of this depends on grower's conditions, compost, pot size, warmth, etc. and is a matter for each grower's judgement. It is important though since roots will rot in gluggy compost and this is a condition to be avoided as plant tend to decline without roots. Plants will grow large if allowed but if space is a consideration, they may be broken up and surplus plants disposed of to keep them a reasonable size. Well worth a place in any collection of miniatures, especially Australians.

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Jones in Nat. Orch. Aust. 607–608, Fig. Col. Pl., 1988.

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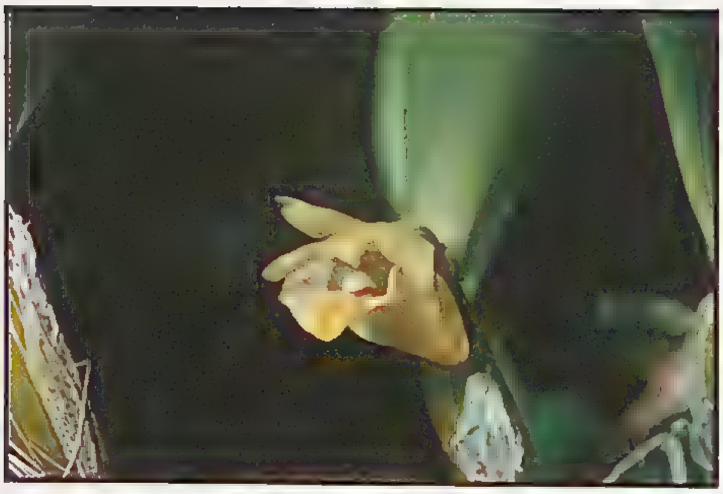


Plate 8: *Flickingeria convexa.* Photo: W. T. Upton.

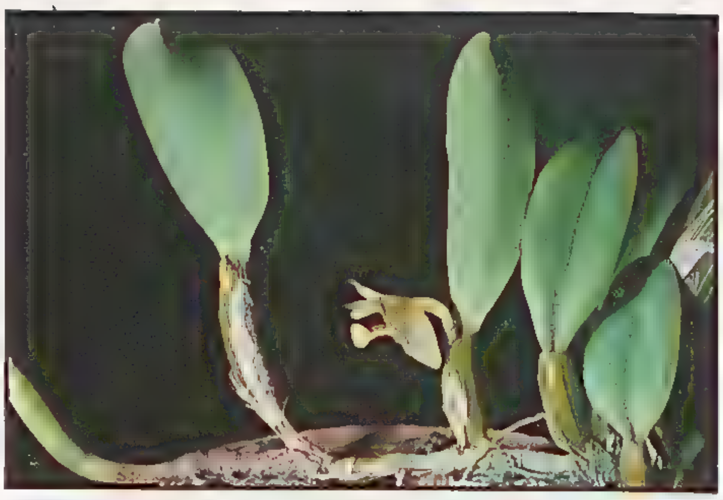


Plate 9: *Flickingeria convexa.* Photo: W. T. Upton.

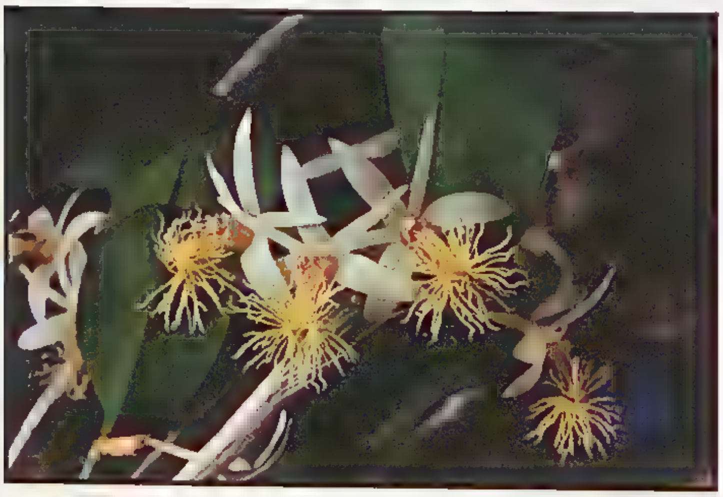


Plate 10: *Flickingeria comata.* Photo: W. T. Upton.

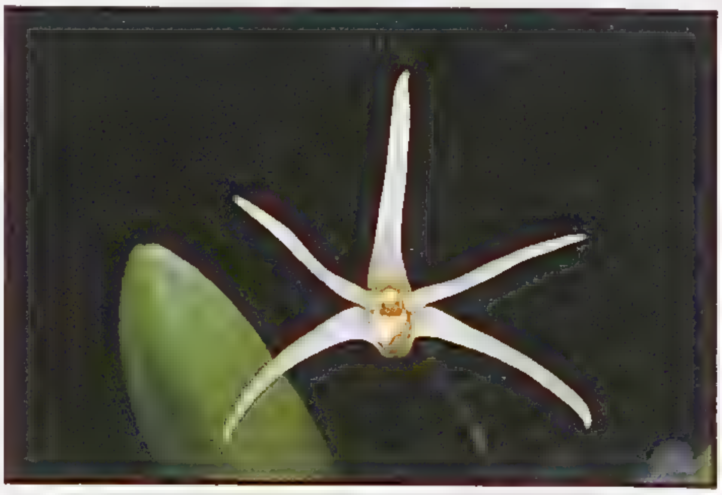


Plate 11: *Diplocaulobium glabrum.*
Photo: W. T. Upton.

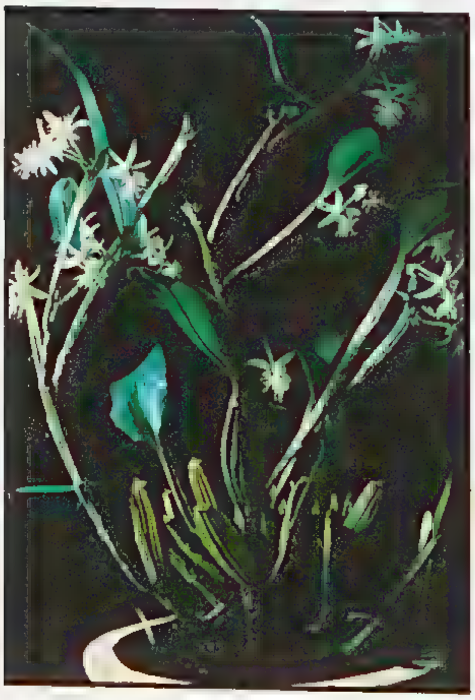


Plate 12: *Flickingeria comata.*
Photo: W. T. Upton.

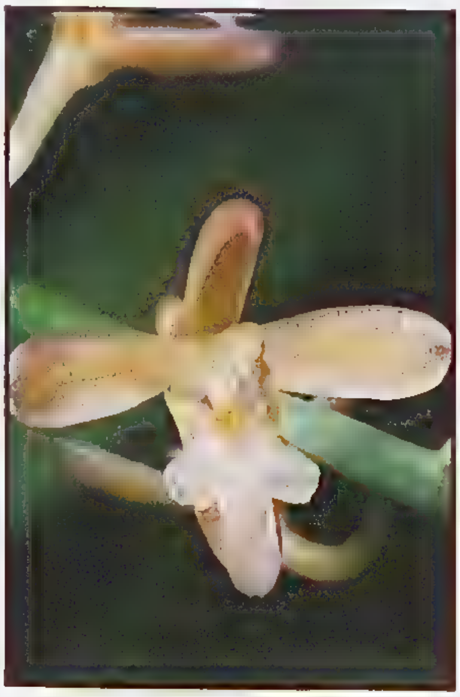


Plate 13: *Acriopsis javanica.*
Photo: D. Titmuss.

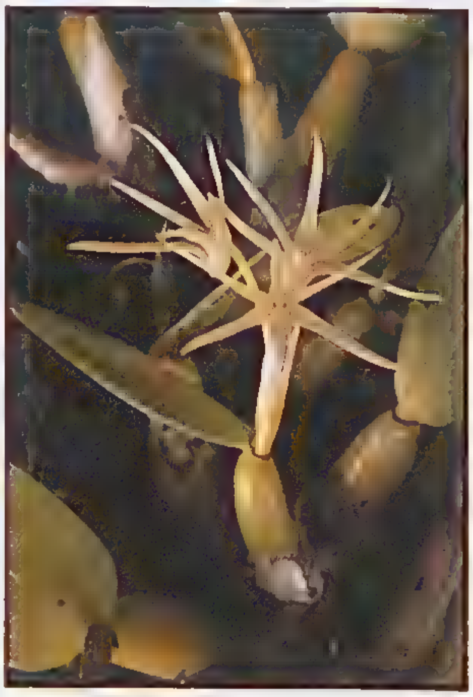


Plate 14: *Diplocaulobium glabrum.*
Photo: W. T. Upton.

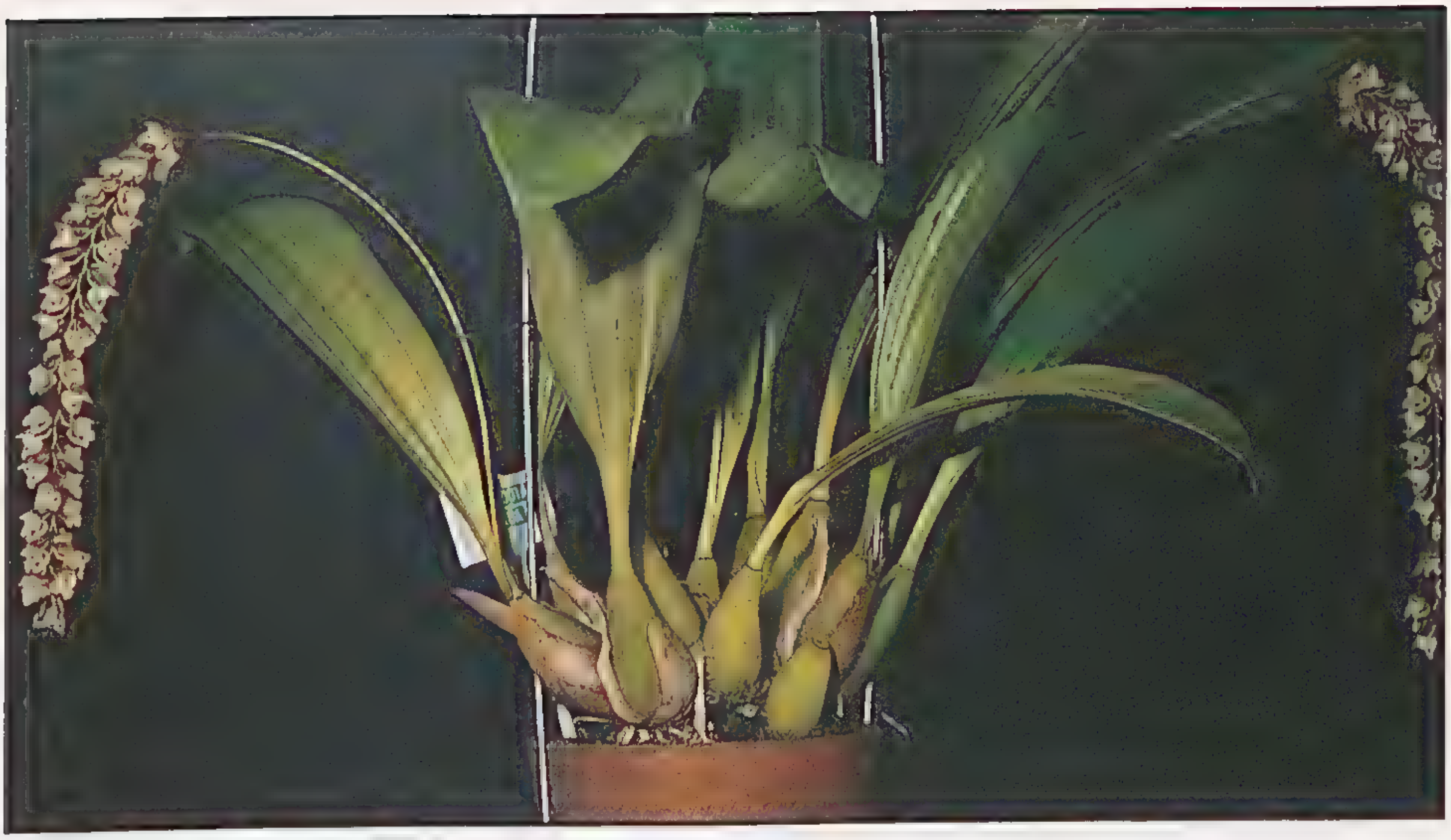


Plate 15: *Pholidota imbricata.*

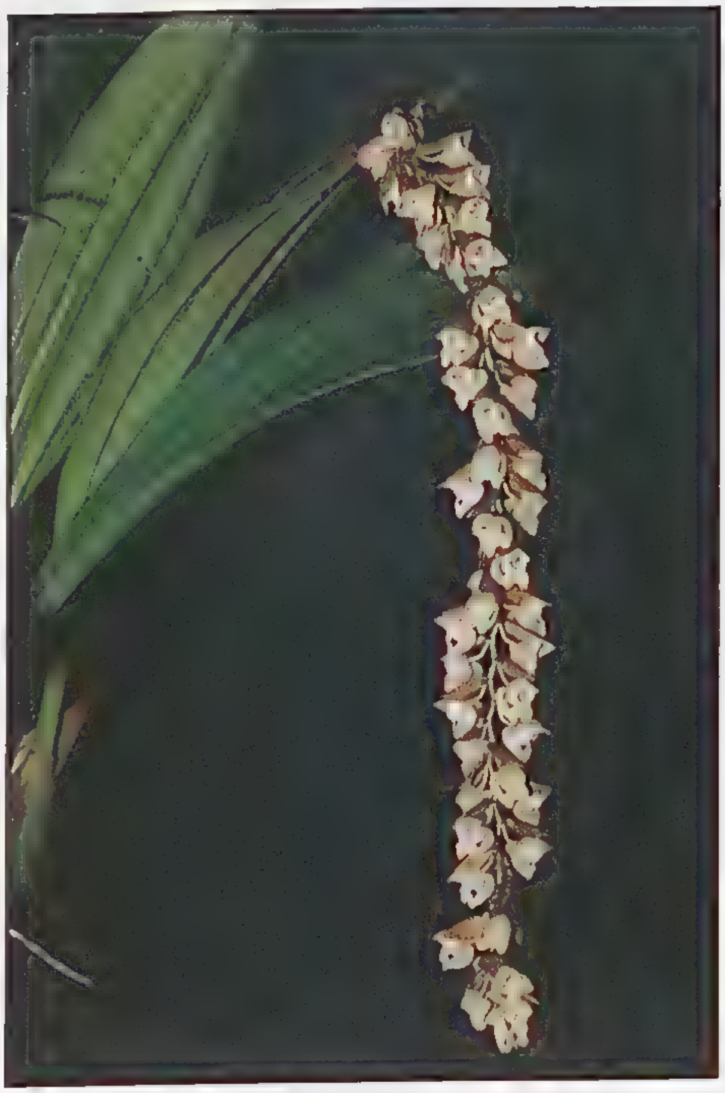


Plate 16: *Pholidota imbricata.*

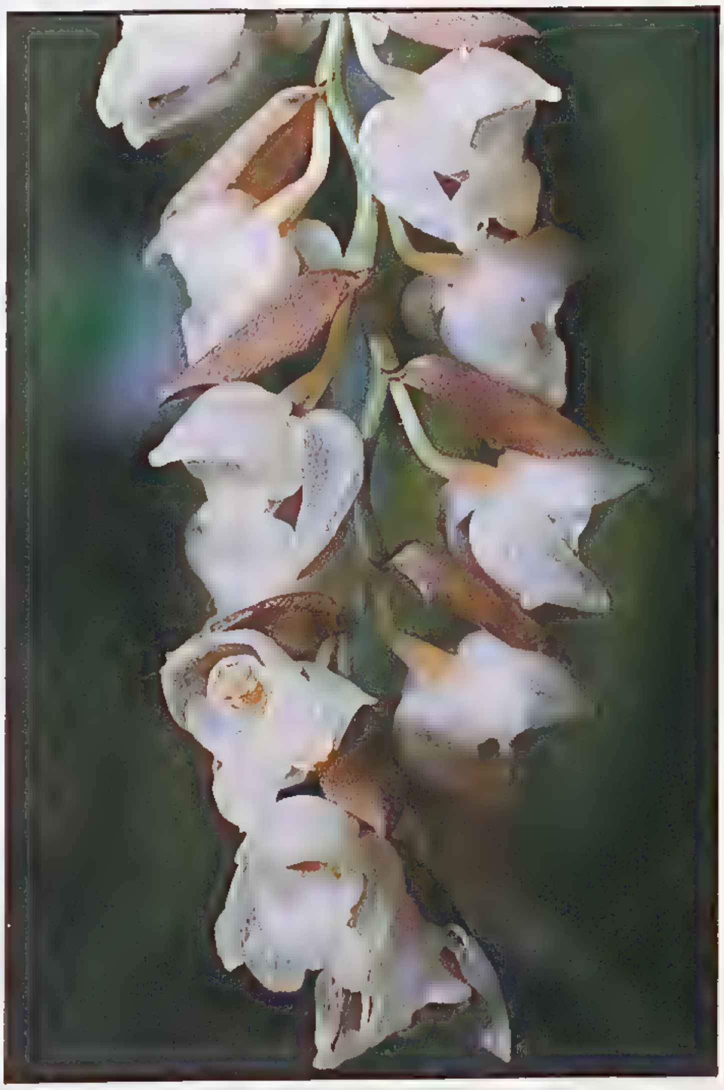


Plate 17: *Pholidota imbricata.*

Photos W. T. Upton.

AUSTRALASIAN ORCHIDS ILLUSTRATED

No. 21: *Pterostylis alpina* R. S. Rogers

Common Name:	Mountain Greenhood
Subfamily:	Orchidoideae
Tribe:	Diurideae
Subtribe:	Pterostylidinae
Genus:	*Pterostylis* R. Brown

Distribution: The genus *Pterostylis* is endemic to Australia, New Zealand, New Caledonia and New Guinea. *Pterostylis alpina* is found in Victoria, New South Wales and may extend into Tasmania.

Notes: All *Pterostylis* are terrestrial orchids, but occasionally plants can be found growing epiphytically on treefern trunks. *Pterostylis alpina* is generally found in the highland forests and often in protected or moist areas. There has been some confusion to the taxonomic limits of this species, with some authors placing *P. alpina* into *P. scabrida,* while *P. monticola* has been recently named and split from *P. alpina. P. alpina* is a colony forming orchid, which can be found in flower from spring through to late summer in the higher altitudes. A flowering plant has a loose rosette of three to five robust leaves which surround and slightly ascend the stem. The flower is usually solitary and atop the stout stem which is up to 30cm tall. The flower is typical of a *Pterostylis* with the partial fusion of the lateral petals and the dorsal sepal to form the galea, which is strongly banded and up to 3cm long. The galea is upright for the majority of its length before it curves forward to a short blunt tip. The fused base of the lateral sepals are upright and close to the front of the galea for half its length. Where the lateral sepals split, they sweep backwards and wrap around the galea before the tips project straight back. The labellum is lanceolate and straight for most of its length, then it sharply deflexes so that the tip protrudes from the sinus of the lateral sepals. The closeness of the lateral sepals to the galea aids in trapping the pollinator in the base of the flower, so that the only way out is past the stigma and pollen.

Pollination: There is no recorded pollinator for this species. A few species of *Pterostylis* are reported to be pollinated by fungus gnats.

Conservation Status: This species is not under threat, as it is found within a number of National Parks and reserves.

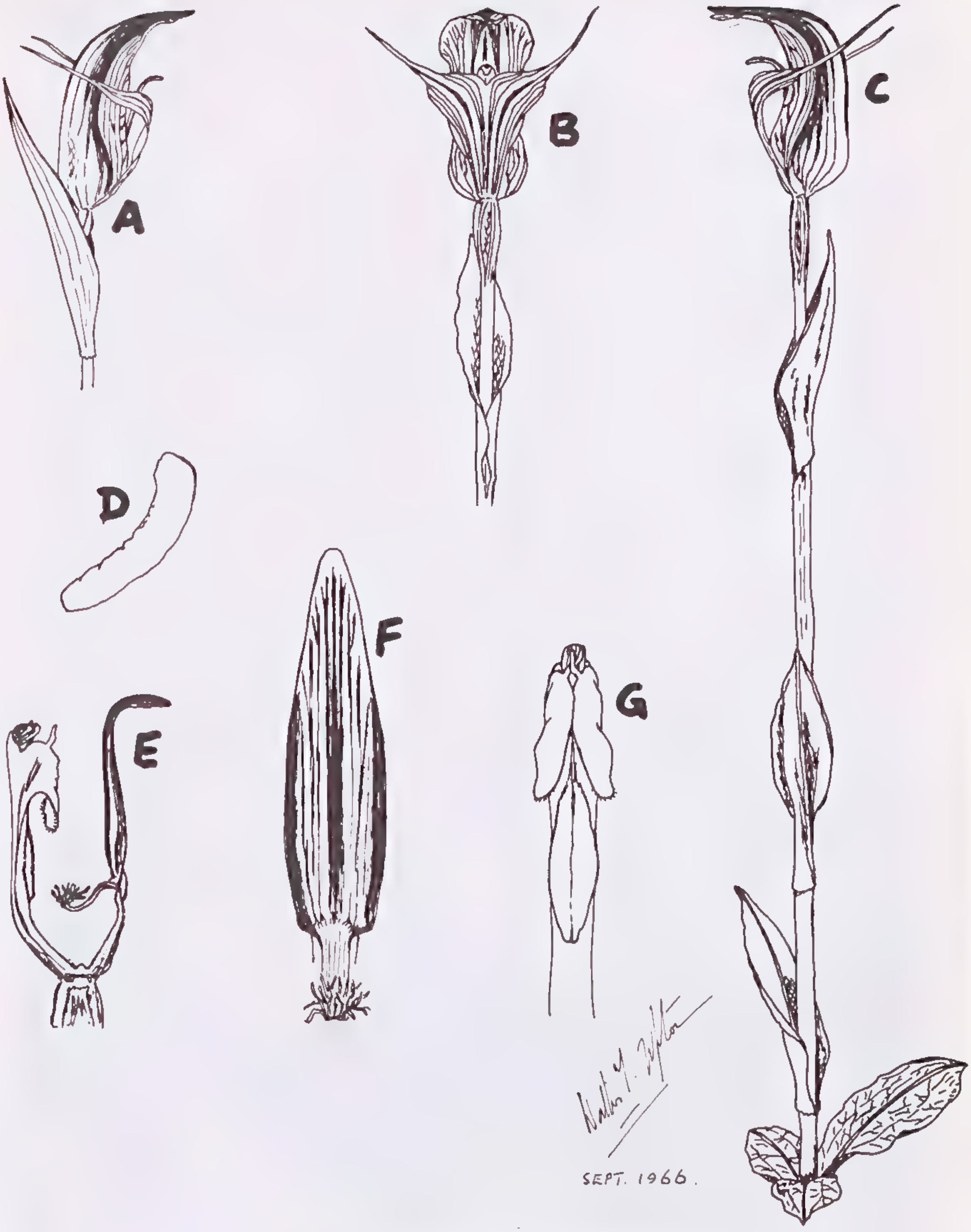
Culture: *Pterostylis alpina* is a colony forming terrestrial. These orchids grow well under 50% shade in a basic terrestrial orchid mix. The pots should be watered from late February to late spring as the tubers have a long dormancy period, with the plants appearing shortly before flowering.

Illustration: Painting: Illustrated are seven plants of *P. alpina,* five of which are in flower. Note the position of the lateral sepals around the galea. The loose rosettes of leaves seen at the base of the flowering stems can also be seen as distinct from the rosettes of the non-flowering plants.

Description: Tony Slater, 17 Dudley Street, Mitcham, Victoria 3132.

Illustration: Louise Saunders, 8 Lisa Street, Cleveland, Queensland 4163.

Line Drawings and Captions: Walter T. Upton, P.O. Box 215, West Gosford, N.S.W. 2250.



Pterostylis alpina R. Rogers
Victoria

(A) Flower, side view, 1X; (B) Flower, front view, 1X; (C) Plant, 1X; (D) Pollinia, approx. 16X; (E) Column and labellum, side view, 2X; (F) Labellum, from above, 4X; (G) Column, front view, 4X.

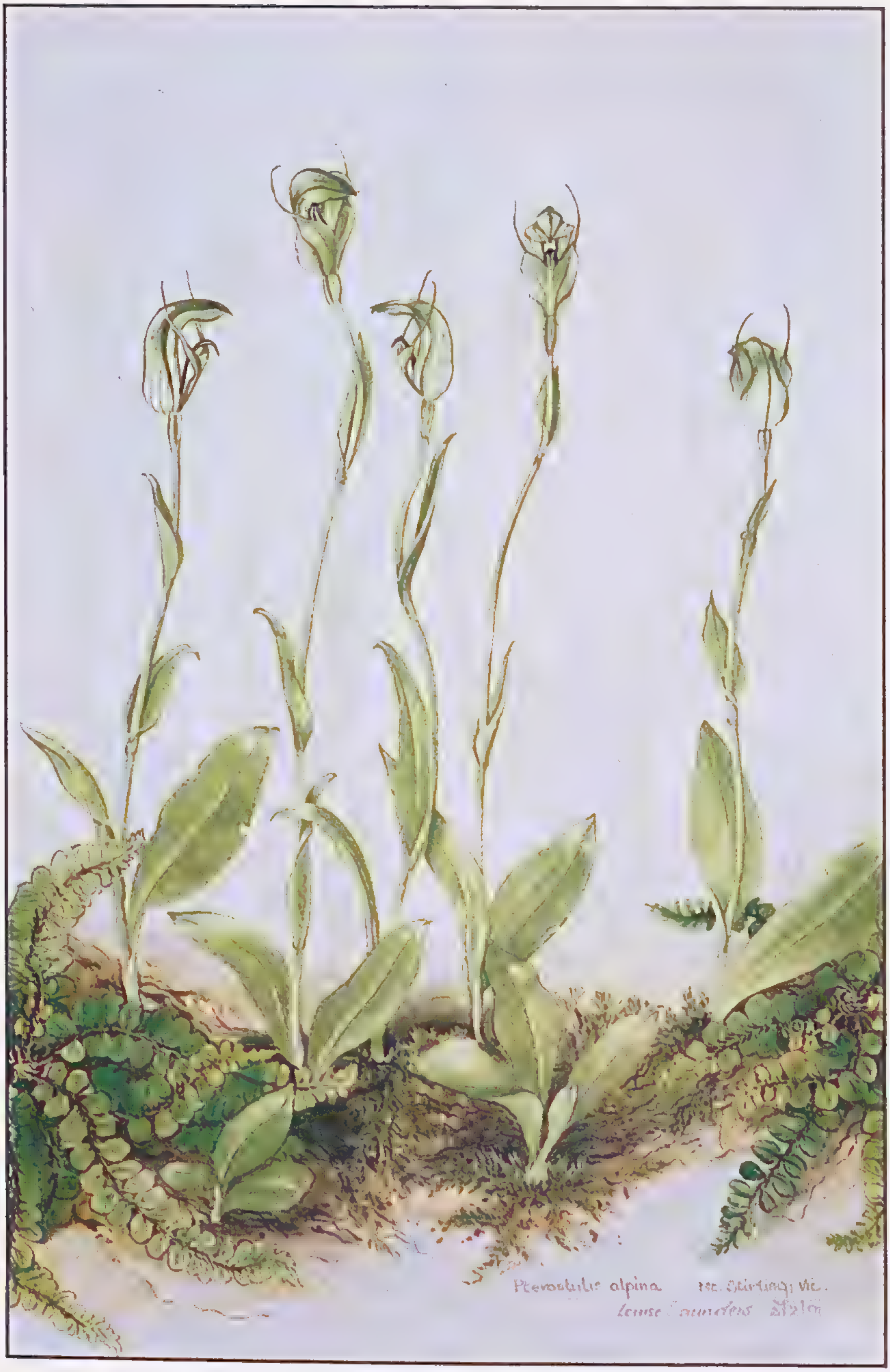

Pterostylis alpina Mt. Stirling, Vic.
Louise Saunders [illegible]

Plate 18: ***Pterostylis alpina*** R. Rogers
From a painting by Louise Saunders.

THE GENETIC SIMILARITY BETWEEN TWO DIFFERENT POPULATIONS OF *DIURIS SEMILUNULATA* MESSMER *(ORCHIDACEAE)*

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ABSTRACT

Two morphologically similar populations of *Diuris semilunulata* Messmer, each having basic differences in flower colour (Black Mountain: flower yellow and lightly blotched and Mount Jerrabomberra, N.S.W.: flower orange yellow and heavily blotched), were examined genetically using starch gel electrophoresis. There was no significant difference in the allele frequency in seven polymorphic ensyme systems observed, thus both populations are genetically similar and the observed differences in flower colour were not due to the alleles studied.

INTRODUCTION

Protein electrophoresis has been used extensively in providing a relatively rapid and sensitive means of detecting genetic variation in a number of plant species (Coates, 1990; Marshall and Weiss, 1982; Panetta, 1990). The utility of this technique has also been demonstrated in cultivar identification (Mielke and Wolfe, 1982; Wendel and Parks, 1983; Schwennesen *et al.*, 1982 and Bringhurst *et al.*, 1981), in distinguishing interspecific hybrids (Sharma and Jones, 1992; Sharma and Clements, 1993) and in the development of chromosome linkage maps (Weeden and Marks, 1984). Another major application involves understanding and solving some of the taxonomical problems at the level of population, sub-species and species. Preparation of gel and enzyme extraction is relatively simple and the method can be used to quickly determine an organism's genotype independent of judgement based on phenotypic information (Gottlieb, 1971).

The present study was directed toward solving the problem of recognising similar populations of *D. semilunulata* Messmer, where flower colour indicated differentiation. *D. semilunulata* is a common terrestrial orchid of the Australian Capital Territory and the Southern Tablelands of New South Wales (Jones, 1988). Plants growing on Black Mountain, A.C.T., are notable in having yellow, lightly marked flowers, when compared with those from Mount Jerrabomberra (the type site of the species) and other sites in the Southern Tablelands where the flower colour is orange yellow with heavy blotching. Apart from the colour differences, the flowers from all sites are morphologically similar. The aim of this study was to determine if the colour differences in two populations 25km apart, were genetically controlled or not.

MATERIALS AND METHODS

Samples obtained from 30 plants growing at each site (Black Mountain, A.C.T. and Mount Jerrabomberra, N.S.W.), were collected in a plastic bag and placed in a refrigerator at 2–3°C for approximately 12 hours. A peduncle from each plant was mashed in a drop of extraction buffer (phosphate buffer, pH 6.90, Dithiothreiotol 1mg/ml, Polyvinylpyrrilidone PVP, mol. wt. 40,000) in a 2.5ml plastic vial and the extract absorbed onto 6x4mm chromatography paper wick.

Starch gel was prepared following the method of Conkle *et al.*, 1982. three buffer systems (i.e. Histidine, Lithium variant and Morpholine citrate) were used to assay twelve enzyme systems. The gel was run for five hours at 60mA constant electric current in a refrigerator at 3–5°C. After the run, gel was trimmed and cut into three slices and each slice was then used for different enzymes. Twelve enzyme systems namely: Glucophospho

Isomerase (GPI, EC 5.3.1.9), Isocitrate Dehydrogenase (IDH, EC 1.1.1.42), 6–Phosphogluconate Dehydrogenase (6PGD, EC 1.1.1.44), Malate Dehydrogenase (MDH, EC 1.1.1.37), Uridine diphosphogluconic pyrophosphatase (UDP, EC 3.4.11.2), Shikimate Dehydrogenase (SDH, 1.1.1.25), Alcohol Dehydrogenase (ADH, EC 1.1.1.1.), Glutamate Oxaloacetate Transaminase (GOT, EC 2.6.1.1), Aconitase (AC, EC 3.2.1.3), Diaphorase (DIA, 1.6.4.3), Menadine Reductase (MR, EC 1.6.99.2) and Malic Acid (ME, EC 1.1.1.82) were assayed following the methods of Wendel and Weeden, 1989. Data was analysed using the software BIOSYS-1 (Swofford and Selander, 1981) to calculate the estimates of genetic variability between the populations.

RESULTS AND DISCUSSION

Repeated sampling of specimens from the two populations produced consistent results. Seven polymorphic enzymes coded by 10 loci were assayed and the loci scored were: GPI, 6PGD-1, 6PGD-2, MDH-1, MDH-2, SDH, IDH, UGP-1, GOT-1, GOT-2. A number of other enzymes were also tried but due to complex banding patterns (DIA and MR) or unscorable bands (ACO and ME) or monomorphic loci (ADH) these enzymes were not included in the analysis. Various alleles were observed which were present in both the populations.

Chi-square test on allele frequency and paired sample t-test on observed and expected heterozygosity (Ho, He) showed no significant differences between the plants from the two localities (Table 1). Mean number of alleles, frequency of polymorphic loci, observed and expected heterozygosity (Ho and He) were comparable in both the populations (Table 2). The Nei genetic identity value (Nei, 1978) calculated on the basis of allele frequency was .99, indicating that both populations are of one species. Differences in flower colour between the two populations are possibly due to ecological or edaphic factors or could be due to genetic factors but not detected by the enzyme systems assayed in this study.

ACKNOWLEDGEMENTS

We thank Drs Helen Hewson and Andrew Young for their constructive input into the project and assistance in the area of statistical analysis and Mark Clements for commenting on the paper.

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Table 1: Allele frequency at 10 loci in two populations of *Diuris semilunulata.*

Locus	Mount Jerrabomberra NSW	Black Mountain ACT	Chi-square X2
GPI			
1	.217	.133	
2	.050	.067	
3	.700	.683	
4	.017	.050	
5	.017	.067	4.15ns
6PGD-2			
1	.033	.067	
2	.967	.867	
3	.000	.067	4.99ns
6PGD-1			
1	.033	.067	
2	.817	.883	
3	.150	.050	3.82ns
MDH-1			
1	.000	.033	
2	1.000	.967	2.03ns
MDH-2			
1	.000	.033	
2	.983	.967	
3	.017	.000	3.00ns
SDH			
1	.089	.033	
2	.518	.700	
3	.393	.267	4.48ns
IDH			
1	.917	.950	
2	.083	.050	.53ns
UDP			
1	.017	.017	
2	.483	.367	
3	.350	.517	
4	.150	.100	3.48ns
GOT-1			
1	.883	.900	
2	.100	.100	
3	.017	.000	1.00ns
GOT-2			
1	.617	.733	
2	.383	.267	1.86ns
(N)	30	30	

ns = non-significant

Table 2: Estimate of genetic variability in two populations of *Diuris semilunulata* with standard errors in parentheses.

Populations	A	P	Ho	He
Mount Jerrabomberra NSW	2.7 (.4)	90%	.334 (.092)	.294 (.074)
Black Mountain ACT	2.8 (.3)	100%	.293 (.065)	.282 (.061)

A = Mean number of alleles per locus
P = Frequency of polymorphic loci
Ho = Average frequency of observed heterozygotes
He = Heterozygosity averaged over all loci

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THE EDITOR'S ACKNOWLEDGEMENT

As this issue is my last as editor I must acknowledge with a deeply felt sincerity all the help I have received from the A.N.O.S. Central Coast Group. For over four years these wonderful people have helped me, without a murmer, indeed I truly believe they have enjoyed it.

When I have put the journal together and taken it to Gosford Printing, where the proprietor, Bob Pickett, has always been most helpful, he and his employees have gone out of their way to produce a first class job. In particular I must mention Paul Eleven, the typesetter and a member of the Central Coast Group, for his concern and interest in our journal, if I missed something in my editing he usually picked it up. He helped in so many ways — made up a dummy to assist in the placing of the colour pages for the greatest economy, etc. His knowledge of orchids was also of great assistance.

As soon as the "proofs" were ready to be checked, the proof reading team were alerted and they always came to our home on the following Saturday morning. We usually split up into three or four pairs, one reading, once checking. Thank you, Marian Cail, Paul Eleven, Ena Middleton, Bruce Murray, Gary Sweikert and my wife Jill. Many others helped us on a casual basis, from time to time, when one of the regulars were unable to be present. After the proof reading I spent most of the following Sunday going through it again in the attempt to have a perfect copy, but did not always succeed.

The address labels for mailing *The Orchadian* were in the early part kept by Peter Eygelshoven on his computer and printed by him, later by Laurie Jarvis. Thank you both.

When the printing was completed my wife Jill and I picked the whole lot up and took them to the home of Lois and John Simmons at Wyong for packing and preparing for mailing. The mailing team (Plate 19) under the direction of Lois Simmons, comprised her husband John, Pat and Reg Burns, Margaret and Albie Sherwood, Jill and I and occasionally Janet and Bob Napier came up from Sydney. This was not only a busy morning but a most pleasurable one. A delightful and appetising morning tea and lunch was always provided by Lois. I am sure we will all miss these happy occasions, I know I will. My thanks to the mailing team and a special thank you to Lois for organising such an expert project.

For the last 16 issues our journal has always been mailed to members by the due date. ✻

OUR EDITOR-ELECT

David Paul Banks (Plate 20) was born at Parramatta, N.S.W. on 18th March, 1965 and is employed as a bank manager with the A.N.Z. Bank.

He started growing orchids at five years of age, began hybridising native orchids at 10 years and has already registered numerous hybrids.

He has an extensive orchid collection, including over 1,000 different orchid species. With his parents Graeme and Lynette Banks he runs Hills District Orchids. His father is the current President of the Australian Orchid Council. Many of his articles and photographs have been published regularly in *The Orchadian*, *Orchids Australia* and *The Australian Orchid Review* as well as contributions in a number of orchid books.

David has spoken at Australian Orchid Conferences, A.N.O.S. Conferences and at workshops throughout Australia as well as being a regular speaker at Orchid Societies in N.S.W. and interstate.

He is a fully accredited judge of the Orchid Society of N.S.W. and the Australian Orchid Council.

David has already made a great impression on the orchid world in Australia. He was President of the Parramatta and District Orchid Society from 1985 to 1987, being the youngest President ever of an Australian Orchid Society (just turned 20 years).

Plate 19: *The Orchadian* packing and mailing team (L. to R.): Wal Upton, Reg Burns, Jill Upton, Albie Sherwood, Margaret Sherwood, John Simmons, Lois Simmons, Pat Burns.

David currently holds the following positions in the orchid sphere:–

- President of Orchid S.P.E.C.I.E.S. (N.S.W.) Inc. since 1993.
- Vice-President of the Orchid Society of N.S.W.
- O.S. of N.S.W. delegate on the Ira Butler Trophy Committee.
- Patron of the Launceston Orchid Society.
- Member of the Publications Committee of the Australian Orchid Council.
- Editorial Associate and Technical Advisor for *Orchids Australia.*

David we all wish you well as the seventh editor of our journal *The Orchadian.*

Plate 20: David Paul Banks.

LETTERS TO THE EDITOR

16 Fonti Street
Eastwood 2122
Ph: (02) 874-9067
29th February, 1996

The Editor
The Orchadian
Dear Wally

I write to add my voice in support of Dr P. S. Lavarack in his letter entitled "Orchid Taxonomy — What Names Should We Use". Although my involvement in the cultivation and study of our native orchids has waned somewhat over the past years, I have been following the debate over taxonomy with some interest and at times some annoyance. Having read Dr Lavarack's proposal suggesting that *The Orchadian* set the lead by following the nomenclature of Alick Dockrill in his revised *Indigenous Orchids*, I raise my voice in support of his proposal and strongly urge others and particularly the A.N.O.S. Council to follow suit.

As one trained in Botany and Horticultural Science and who has been avidly studying and cultivating both our epiphytic and our terrestrial orchid species for over 20 years, I agree that the debate over nomenclature is not in itself a bad thing. Certainly, there are advantages in splitting some previously diverse species into a number of separate species, especially if doing so aids our attempts at preservation of the species. For example, it is easier to gain government and public support for the preservation of habitat of the last known colony of a particular species, than for the last known habitat of a particular variety or sub-species of an otherwise quite common or widespread species (e.g. *Diuris punctata*, at one time including virtually all known purple *Diuris*, some varieties and forms of which are now endangered if not extinct). However, to make it impossible to identify a plant without resorting to D.N.A. tests, identification of the pollinator or some complicated laboratory-based procedure seems to me to defeat the whole purpose of taxonomy.

Surely the purpose of taxonomy is to enable us mere mortals to identify and classify the myriad of life with which we share this planet and if in our case an educated layman with a layman's resources of field guide, magnifying glass and perhaps a binocluar microscope as suggested by Dr Lavarack cannot do this then I would suggest that somewhere along the line we are guilty of falling into the old trap of not being able to see the wood for the trees.

Yours faithfully,
Rev. Peter R. Dunstan

P.O. Box 314
Lae, Papua New Guinea
10th February, 1996

The Editor
The Orchadian
Dear Wal

Subject: Taxonomy of New Guinea Pencil Orchids

Thank you for the drawings of the pencil orchid flowers and particularly of the one called 'Black Pam'. I would like to bring you up to date with my taxonomic research with this group as sometime back I had made a declaration that I was researching pencil orchids with Tom Reeve. He withdrew from this project and I then indicated to other researchers in Australia and Kew that I would continue on with this project on my own.

To date I have illustrated all the species that we know occur here. The established and proposed names are as follows: *Dendrobium flagellum, D. chordiforme, D. rigidum.* New species: **D. araucaricola*, **D. ramuanum*, * *D. rugolabium*, **D. meliniflorum*, **D. laiagamense.* All holotypes of the new species are held at Lae.

It is proposed to name your 'Black Pam' *D. meliniflorum.* This was a name suggested by Tom Reeve and I propose to use this name. A key has been drafted for this. The initial one was examined by Dr Barry Conn (Sydney Herbarium) quite sometime back and the long delay in going to print has been the loss of one holotype *(D. rugolabium).* Hopefully this will be found.

My research has only covered the Papua New Guinea side. From talks with Dr Elizabeth Widjaja (Bogor) I believe that the Pencil orchids extend well into Irian Jaya, but I have not been able to obtain any specimens from there to date.

I also discussed 'Black Pam' with Phil Spence who kindly sent me flowers from his collection. These coincidently arrived not long after your illustration was received. This species has a broader range than most past collectors are aware of. There is a lot of variation over the geographic range of the more common species of this group, which no doubt some people would use to create more new species and I hope to cover as much of this variation as collection time and travel will permit.

I hope this little bit of information on your 'Black Pam' will be of some value to you and other growers and hybridists.

Nev Howcroft

(Ed.—*These are proposed names and should not be used until validly published).

Dear Sir,

RE: *Dendrobium* Yondi 'Kayena'

The March, 1996, issue of *The Orchadian* contained an article which stated that my plant of *Dendrobium* Yondi 'Kayena' had been granted Awards of Merit by the Orchid Society of New South Wales and the Australasian Native Orchid Society. This information was incorrect — the actual awards were Awards of Distinction.

I have checked the manuscript which I submitted to you and have established that the error was mine and mine alone.

I am at a complete loss to explain how I came to make such a mistake because I was quite clear as to the nature of the awards granted and have long been aware of the vast difference between an A.M. and an A.D.

Whatever the cause, I can only tender my apologies to you and your readers, to the orchid Society of New South Wales and to the Australasian Native Orchid Society.

Yours sincerely,
Ted Gogerly

NOTICE FROM A.N.O.S. COUNCIL —

THE AUSTRALASIAN NATIVE ORCHID SOCIETY INC. ANNUAL GENERAL MEETING AND ELECTION OF COUNCIL AND ADVISORY COMMITTEE MEETING

The above meetings of the Society will be held at the Gosford R.S.L. Club, 26 Pacific Highway, West Gosford on Saturday, 4th August, 1996. Hosted by the A.N.O.S. Central Coast Group. Morning tea will be served from 9.30 a.m. and lunch will be available at the club.

The A.G.M. will commence at 10.00 a.m. and the Election of Council for 1996–1997 will take place.

The A.N.O.S. Advisory Committee Meeting will be held in conjunction with the above, commencing after the closure of the A.G.M.

A.N.O.S. Groups and associated Native Orchid Societies are requested to advise the Secretary the names of their delegates to the Advisory Committee Meeting or to nominate proxies (if required) before 27th July, 1996.

NOMINATIONS FOR ELECTION TO COUNCIL

Nominations for the election of A.N.O.S. Council are called for. These should be signed by a member of the Society, countersigned by the nominee accepting nomination and lodged with the Secretary no later than 27th July, 1996. Positions to be filled are: President, Vice-President, Secretary, Treasurer, Editor plus seven Councillors.

DON'T BE A DELINQUENT SUBSCRIBER

If you are, you will not receive the September issue of *The Orchadian.* The Membership Renewal Application was included in the March issue. If you are unsure of your financial status, check the address label of this issue.

96 – (followed by your postal area code number) means Renewal necessary. Financial to 30/6/96
97 – (followed by your postal area code number) means Renewal not necessary. Financial to 30/6/97.

If you have misplaced the Membership Renewal Application, another is enclosed. Send this and your remittance or credit card authorisation to:–

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Late renewals will receive all issues, of necessity by normal post, attracting up to three times our discounted bulk rate, therefore the Society would appreciate your timely renewal in order to keep our costs (and your subscription) to a minimum. ✾

NOW IS THE TIME TO CONSIDER WHICH PLANTS YOU ARE GOING TO EXHIBIT AT THIS YEAR'S SPRING SHOWS. NOT THE DAY BEFORE THE SHOW. PREPARE AND GROOM YOUR SHOW PLANTS NOW!

BOOK REVIEW

AN ATLAS OF ORCHID POLLINATION — European Orchids
By N. A. van der Cingel.
Hardcover — 285mm x 208mm, 175 pages with 123 excellent and informative colour pictures and 64 black and white figures.
ISBN 90 5410 190 3
Published in 1995 by A. A. Balkema, P.O. Box 1675, 3000 BR Rotterdam, Netherlands.
Price $US 85.00.

I enjoyed reviewing this book, mainly because it has so much to offer the reader who is interested in this all encompassing subject and the fact that it is easy to read.

Although the book is basically focussed on European orchids, the principle of orchid pollination is the same the world over and this book dispels the secrets and presents the facts in a straightforward way. It is written in a coherent manner, with a minimum of biological jargon. If you are seriously interested in the production of orchid seed this book is for you.

After discussing "Why This Book?" and then in the introduction, "The Mystery of Orchidiocy", in which the author states ". . . orchids are inextricably linked with sex and eroticism"; we move on to Part One.

This part is quite essential for anyone who wishes to partake in the fundamentals of seed rasiing, whether the orchids be European or Australian.

Chapter One is "The History of Orchid Pollination", covering the general history of plant sexuality as well as its pollination history.

Chapter Two: "The Evolution of Orchid Pollination", starts off with "The Fossil Record", this includes a picture of the oldest fossil orchid *Eoorchis miocaenica;* then flows freely through adaptation and relationship, origin of the orchid flower on to evolution conditions and co-evolution, in which it is stated: "The interdependency between orchids and pollinators is such that the evolution of one may influence that of the other". This chapter closes with non-flower characters determining evolution.

Chapter Three: "The Morphology of Orchid Pollination", includes the morphology of the pollinator as well and is followed by a most interesting chapter on "The Typology of Orchid Pollination" which very clearly sets out the numerous characteristics that comprise the various pollination syndromes — bee, moth, fly and beetle as well as deceit flowers, mimicry and shelter simulation. Many specifics on European Orchids are mentioned but our Australian *Cryptostylis leptochila* gets a mention with regard to pseudocopulation between pollinator and orchid.

Next we move on to "The Mechanics of Orchid Pollination", explaining resupination, an important factor in the study of pollination, followed with the deposition of the pollinaria, the movement of the labellum as well as the movement of the pollinia in self pollination. This kind of reproduction is clearly described, self pollination is quite common among numerous Australian native orchids.

Chapter Six explains: "The Chemistry of Orchid Pollination" by way of nectar, fragrance and the scents.

The next three chapters deal with the mathematics, animal behaviour, economy of foraging behaviour of pollinators, etc., in pollination.

Chapter Ten is an all important one: "The Genetics of Orchid Pollination". A clear insight into the laws and facts of genetics. The gene-pool is explained together with genetic variation, drift, etc. The Australian native *Leporella fimbriata* was used to illustrate the research being carried out on variance. Pollen flow is discussed using *Prasophyllum fimbria* from Australia as the model. Hybridisation and pollination dynamics conclude this chapter.

The last three chapters in Part One deal with research methodology, a comprehensive glossary and the taxonomy of orchids.

Part Two is the Systematic Account and provides the specific information on the pollination of any European orchid. The text is supported by many drawings and goes into considerable detail for each species in a most orderly manner.

The 123 excellent colour plates in this part show much of the pollination action. The book is worth buying for these pictures alone. The *modus operandi* of the pollination, in most species, is given, not only in great detail, but in a very simple and understandable form. There is more in this book, than in any other, about the pollination of a particular area's orchids, or for that matter any other book on pollination.

The references at the rear, give a great insight into further reading on the subject. Even the index is in four parts, or should I say there are four indices: 1, of plant names; 2, of insect names (pollinators and visitors); 3, of persons; 4, of subjects.

All in all, I enjoyed this book and it should be on the bookshelf of every serious orchid enthusiast.

Walter T. Upton ✾

SHOW DATES

NEW SOUTH WALES

A.N.O.S. Central Coast	12th-15th September	Floral Festival, Mt Penang, Kariong
A.N.O.S. Port Hacking	8th September 27th October	Spring Show *Sarcochilus* Show both at Scout Hall, Oliver Street, Heathcote
A.N.O.S. Sydney	21st-22nd September 20th October	Spring Show *Sarcochilus* Show both at Baulkham Hills Community Centre
A.N.O.S. Warringah	7th-8th September	Forestville Memorial Hall Starkey Street, Forestville

VICTORIA

A.N.O.S. Victoria	5th-6th October	Holmesglen College of T.A.F.E. Waverley Campus 585 Waverley Road, Glen Waverley

SOUTH AUSTRALIA

N.O.O.S.A.	26th-30th September	Flinders University, Adelaide

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Comber – *Orchids of Java*	$70.00
R.B.G. Kew – *Revision Dendrobium* sect. *Latourea & Spatulata*	$35.00
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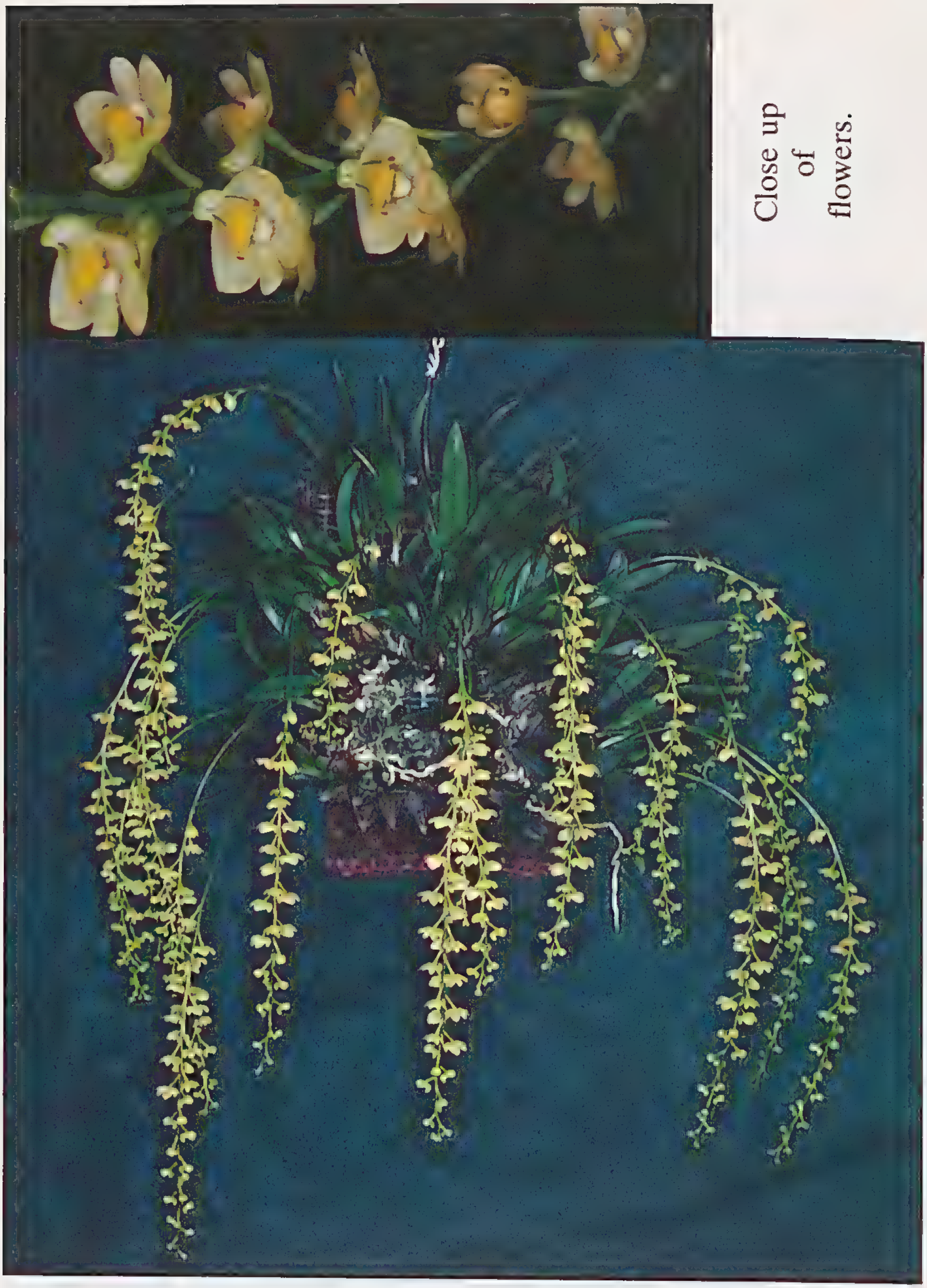

Close up of flowers.

Plate 21: *Dendrobium schneiderae* var. *major* 'Margaret'. Photos: D. Titmuss.

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